ELECTRICAL CONTRACTING

ENGINEERING • INSTALLATION • MARKETING

MAY · 1935

The Business of House Wiring

What Is Adequate Switching?

A Program For Wiring Safety In the Home

Where and How High Should an Outlet Be?

What Does Inadequacy Cost In Lost Business?

What Wiring Does the Average Rented Home Need?

How Adequate Wiring Is Being Sold In North Carolina

Can Contractors Afford To Buy Very Cheap Wiring Devices?

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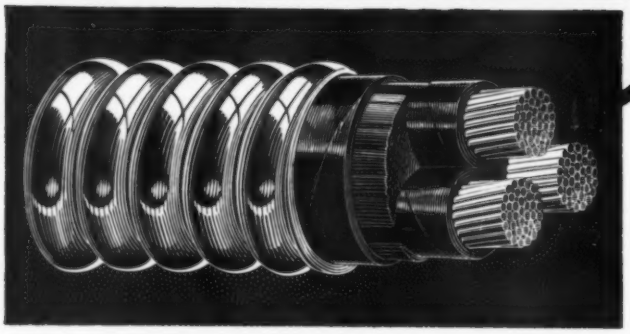
TO MAKE SELLING EASIER

Specify GLYPTAL INSULATED CABLE



ON your next big proposition tell the prospect that you would like to furnish Glyptal cloth-insulated cable for power circuits. You can then explain that he will get a first-class wiring job—a job that will last him a lifetime—and one that will in the end save him money. Glyptal will help you to sell the complete job.

WHAT THIS CABLE IS—It is much like varnished-cambric-insulated cable, except that the cloth or "cambric" is treated with Glyptal varnish instead of the standard compound.

This gives the cable superior advantages. It is tougher and more flexible. It can be safely operated at higher temperatures. It has longer life. And it is unaffected by hot oils, acids, or chemicals. The cable can be furnished with any type of finish, for installation in ducts, conduit, or directly in the earth. The type illustrated has an interlocked steel armor.

ACCEPTED BY INDUSTRIALS—Since its introduction two years ago, Glyptal cable has won widespread acceptance, particularly among large industrial users. This is especially true where service conditions are unusually severe—such as the presence of oil, acids, moisture, and high temperatures—under which ordinary cable would go to pieces. Our nearest office will gladly supply you with the names of users in your vicinity, and you and your customers can check them to see the highly satisfactory operation that Glyptal cable is giving.

You can get G-E insulated cable in every type, size, and voltage for every application. If you are in doubt as to the type to recommend for a particular job, a G-E cable specialist will help you. You can reach him through the nearest G-E distributor or G-E sales office; or address General Electric, Schenectady, N. Y.

520-40

OTHER BEST SELLERS

G-E FLOOD-LIGHTS

There are many places where you can add to your profits by selling floodlights—filling stations, construction jobs, parking fields, athletic fields, and many others.

G-E floodlights are well and widely known. The copper-bronze unit, for example, is accepted as standard by many large oil companies. It is illustrated above. Also popular, is the inexpensive open-type floodlight (AL-45), of which many thousands have been sold in the last year.

G-E TIME SWITCHES

Another profitable line for contractors is the G-E Telechron motor time switch. It will cut out expensive service calls. You do not have to wind clocks, set time, lubricate bearings, or free sticky contacts.

Installed as an integral part of any wiring job, G-E time switches often bring repeat orders and new business because of their reliability. These switches stay sold and keep selling for you.

GENERAL ELECTRIC

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ELECTRICAL CONTRACTING

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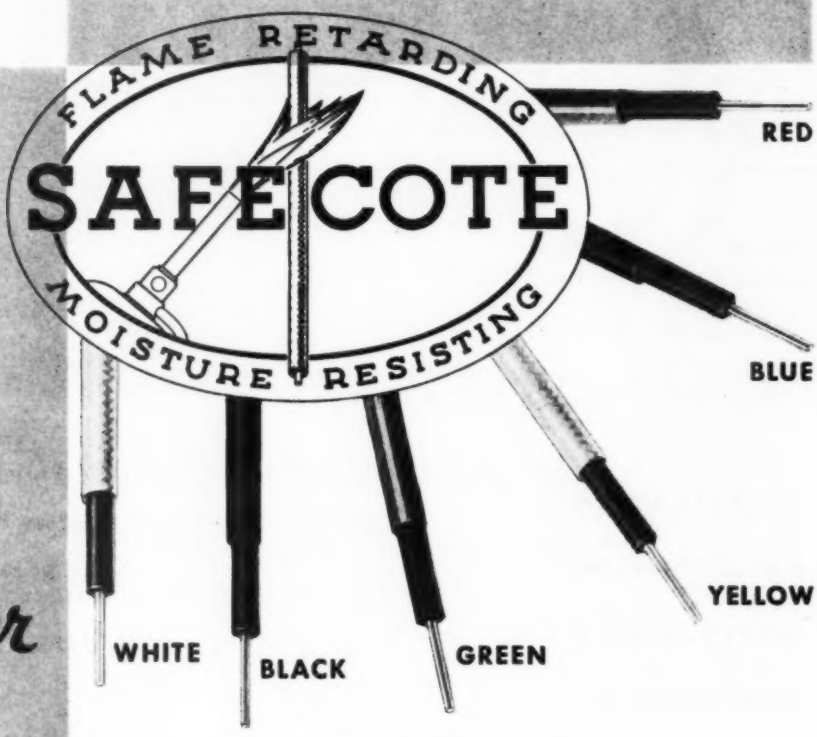
1,635,829	1,765,000	1,410,790
1,772,436	1,798,486	1,536,549

NO WIRE *can be better than its* INSULATION



Wire-life and satisfactory performance depend directly on insulation. And the quality of any insulation rests upon rubber. That is why "U.S." with its vast experience in all fields of rubber development can make better insulation. Why "U.S." Safecote provides the ultimate in wire performance. Made in all sizes, in a variety of colors.

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1935 is the 25th anniversary of "U.S." Rubber plantations in the Far East. And the crude rubber production of "U.S." is now more than three times the combined output of all other American rubber companies combined. Controlled quality from the actual planting of the rubber tree, bud grafting, tapping and so on down through the various manufacturing operations to the finished product, assures extra value and extra performance for the user.

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MAY 1935

The Bottle Neck

HOUSE wiring, as such, is probably one of the most important subjects that the electrical industry has to consider. It is the channel which virtually controls the flow of a market with a potential as big as the national debt. Nevertheless it is pretty much an orphan.

If consideration is given to the electric range, water heater, washing machine and the other appliances, plus the lighting and wiring of the home, it is not difficult to visualize a $1,000 electrical market per wired home. With twenty-two million wired homes in the country, the total would come to twenty-two billion dollars, which is not far short of our national debt. This is the market that depends in large measure for its velocity of growth upon the amount of wiring in the home.

It is one of those subjects, however, about which much is said but little done. The industry first had available the Red Seal Wiring program. While that was not a complete adequacy program, it did have merchandising possibilities. Unfortunately, the industry did not take it seriously, except in a few places, and so it never made very large progress.

NEXT, the industry developed a standard of adequate wiring for residences. All branches of the industry, through their national associations, have endorsed this standard. Yet almost nothing has been done to promote it.

The situation is somewhat analogous to that of the automobile industry and the relation thereto of good roads. The market for automobiles never could have expanded so rapidly had it not been for the widely extended construction of paved roads. This construction of roads did not come about of its own accord. Automobile commercial associations promoted and sold the idea.

The electric wiring in the home is the good road necessary to be developed to insure the proper expansion of electrical convenience in the home. It is different from the wiring of other types of premises, because it is done mostly by smaller shops, frequently one-man shops, where the contractors are much more of the mechanic, and less of the business man. The amount of money involved in a job is small enough to enable people with virtually no capital to get into the business. For that reason, house wiring has received a bad name.

THIS market, therefore, is more in need of help than any other wiring market. It needs promotion. The men selling house wiring cannot be expected to change their habits from one of price competition to one of selling adequate wiring, unassisted. Moreover, adequate wiring will not sell itself, in spite of the fact that it means millions of dollars to every branch of the electrical industry.

In this issue will be found a survey on adequate wiring possibilities, made by the editors of ELECTRICAL CONTRACTING. If the markets there enumerated are sufficiently attractive, the manufacturers will lose no time in finding a way to promote adequate wiring intensively. The job will not be done until someone is hired to do the job.

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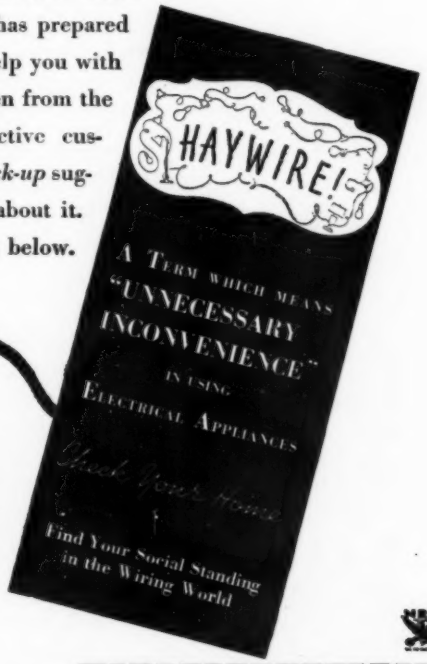
THIS HOUSE IS HAUNTED!

There's many a good house that's haunted — haunted by wiring installations that would give any self-respecting contractor the creeps. Over-loaded circuits. Double and triple sockets. Fearful home-made connections. ¶ The interesting thing about these haunted houses is that there are so many. You'll find them right in your own neighborhood. Every such house is a prospect for a profitable rewiring job —to the electrical contractor who will do some constructive *selling*. ¶ Question—how to start? It's not hard to get permission to "look around" at wiring in customers' homes. When you've spotted a "haunted" house, arouse the owner's interest in the comforts and conveniences he can have with better electrical work. "Build up" your sale. ¶ Graybar has prepared an interesting booklet to help you with your selling job. It is written from the viewpoint of your prospective customer—describes home *check-up* suggestions in detail. Ask us about it. Write—or mail the coupon below.



THERE'S MONEY IN "HAUNTED HOUSES" —THIS BOOKLET CAN HELP YOU FIND IT!

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ELECTRICAL CONTRACTING

MAY, 1935 — VOL. 34, No. 7

S. B. Williams, Editor

FIELD BRIEFS . . .

One way to reduce the cost of cold turkey selling residential repair work was found by a group of contractors of different kinds in Scarsdale, N. Y., who employed a house-to-house salesman who had been on relief work. In the first two and a half weeks this fellow had closed $25,000 worth of repair and maintenance work. Why wouldn't this idea work in other places?

The home offices of a nationally-known insurance company at Hartford, Conn., are equipped with a large public safety demonstration room, and a staff of trained attendants. A prominent part of this demonstration is given over to equipment for demonstrating electrical hazards, such as overloaded circuits, insulation fires, the ignition of combustible dusts and gases, etc. What an opportunity for a local electrical industry to sell re-inspection and safe wiring!

Toronto, the home of Red Seal wiring, has strengthened its specifications slightly for 1935 with the result that in a slightly larger volume of building the increased business to the electrical industry in labor, materials and appliances will be at least $50,000. Almost every builder in Toronto—300 of them—is pledged to build only Red Seal houses.

It costs about $42.00 to open the doors for a day's business with the average motor repair shop, in the opinion of R. E. Ward, Electric Motor and Repair Co., Raleigh, N. C. If this figure is accepted, there is no room for price cutting, or cheaprate service calls in the motor repair business but a powerful strong reason for selling.

It's interesting to see the way in which the contracting business can expand when it is accompanied with initiative, intelligence and salesmanship. S. J. O'Brien, of New York, had for years specialized as an industrial electrical contractor, accustomed to rendering an engineering service to customers and getting a good price for his work as a result. Came the depression and competition at prices that took all of the joy out of getting a job. Mr. O'Brien looks for a field where competition cannot follow and so he takes on commercial refrigeration service for one of the big manufacturers—12,000 new service customers, 4,000 of them on a yearly contract basis, the balance C.O.D. If O'Brien can do this service work in the most densely populated city in the country for a large manufacturer, there should be more reason for contractors acting as service agents in smaller places. And besides why limit it to refrigerators when there are oil burners, stokers, air conditioning units, etc?

A business acquaintance induced William J. Mahan, chief electrical inspector of New Haven, Conn., to inspect his new branch up-state store before the completion of its non-inspected wiring. Six branch circuits of ceiling fixture outlets had been tapped without fuses directly to the concealed main feeder. Forty-six window outlets were all on one circuit. The specified number of circuits were provided within the panelboard, but only two were connected, due to the "skillful" connecting methods previously mentioned. What better example could one want of the value of inspection to the owner, especially when "chiselers" must be dealt with.

An index of the progress of the Better Light-Sight campaign can be had by comparing the increase in sales of surface metal raceway wiring materials. R. M. Johannesen, manager of a Raleigh, N. C., electrical wholesale house, reports sales of such materials for three months of 1935 as being equal to seven months in 1934.

Fires caused by defective wiring in Kansas City showed an increase from 88 in 1933 to 147 in 1934. Other cities have shown similar rates. Is this the price that must be paid for the depression inspection economy when the bootlegging of wiring was rampant?

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An Analysis of Adequate

IN order to determine the direct losses to the electrical industry through its failure to sell wiring adequacy in the houses as they are built, an analysis of eight representative occupied residences is presented for review. Each of these homes is comparatively new and may be said therefore to represent a normal new house condition of wiring.

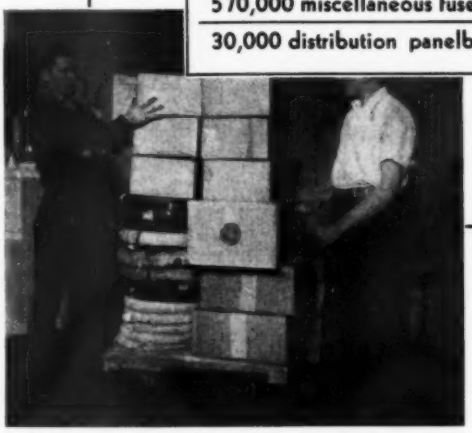
The existing wiring facilities were plotted upon scale drawings for each home, after which these plans were revised to include the additional wiring necessary for compliance with the Industry Standards of Adequate Wiring. Material and labor estimates were prepared from these revised plans, which reflected the additional quantities that would have been needed had these homes been adequately wired when built. A schedule of outlets before and after these revisions appears elsewhere in this article, also the principal items of additional materials and labor, based on an average of these eight homes

A condensed analysis of these homes was purposely prepared in order that it might cover a wider range of areas and types of houses. Home No. 2, for instance, is a "rangy" bungalow of 1,758 sq.ft., while home No. 8 is three stories with a partially finished basement.

The averages as given are not meant to apply to the average small worker's home. A diversified list was therefore selected, which pro-

Adequate wiring in 10 per cent of the 300,000 new homes to be built in 1935 would increase the materials normally used by:

39,600,000 ft. of No. 12 armored cable or non-metallic-sheathed cable; or
32,400,000 ft. of rigid or flexible steel raceway and
81,000,000 ft. of No. 12 wire, and
5,100,000 connectors or locknuts and bushings,
2,640,000 outlet and switch boxes
1,950,000 wiring devices, plus plates
1,020,000 ft. of No. 6 range circuit wiring and accessories
600,000 ft. No. 4 entrance material and accessories
570,000 miscellaneous fuses
30,000 distribution panelboards



Sub-Adequacy Losses to the Industry

What the industry has failed

Circuit Wiring

1150 ft. of 2-conductor No. 12 armored or non-metallic-sheathed cable
170 ft. of 3-conductor No. 12 armored or non-metallic-sheathed cable
170 connectors; or
1080 ft. of rigid or flexible steel conduit, or electrical metallic tubing
170 locknuts and bushings, connectors or couplings; or
2700 ft. of No. 12 SBRC solid wire
330 ft. loom
628 — knobs
732 — tubes

Outlet Materials

21 — outlet boxes and supports
67 — switch boxes and supports

Wiring Devices

32 convenience outlets and plates
12 single pole switches and plates
11 3-way switches and plates
1 3-way switch, pilot light and plate
1 or more 4-way switches and plates
1 combination switch, receptacle and pilot
1 flush clock outlet
2 telephone plates
2 radio outlets
1 illuminated house number
1 weatherproof outdoor receptacle

House Wiring Market Possibilities

Adequate wiring in 10 per cent of the 300,000 new homes to be built in 1935 would increase the labor normally employed by almost:

2,000,000 man-hours, or

50,000 40-hour man-weeks, or

1,000 wiremen would be kept at work continuously for 50 weeks per year

If 1 per cent of our 22,000,000 existing homes were re-wired to industry standards of adequacy each year we would use

44,440,000 man-hours, or

1,111,000 40-hour man-weeks, or

22,220 wiremen would be kept employed 50 weeks per year

vides a moderate basis for comparison, and does not actually employ all the wiring which is to be found in many new homes of $10,000 to $20,000 in cost.

Inasmuch as it is estimated by the Federal Housing Administration that upwards of 300,000 new homes are to be built in 1935, an approximate summary has been prepared which is based on the results of only 10 per cent of these homes being wired in accordance with the Industry Standards of Adequacy. These values are applied to the average home as found to be now wired, thus reflecting the additional items involved. Some idea of these quantities of material and direct labor may be readily appreciated. In addition, there are still further labor values in manufacturing, selling and clerical employment to be considered. Electrician labor alone provides nearly 2,000,000 additional man-hours above that of the inadequate wiring layout.

The comparison of estimated labor costs between new and old wiring indicates that the failure to provide for adequate wiring in the beginning more than trebles the labor cost if this work is done at a later date. More materials are also required in wiring the home later. Some idea of the proportions of this market from the standpoint of labor

As Reflected by Averages in Eight Homes

to sell to the average home . . . . . .

Range Wiring—1 Range Receptacle and Plug

- 34 ft. No. 6 3-conductor armored or non-metallic-sheathed cable and connectors; or
- 32 ft. 1-in. rigid iron, or flexible steel conduit, or electrical metallic tubing, with fittings
- 3 ells or angle fittings for rigid or tubing runs
- 104 ft. No. 6 DBRC wire

Service Entrance—Average (Some require No. 2 wire)

- 24 ft. No. 4 armored entrance cable, entrance cap and connectors; or
- 20 ft. 1¼-in. rigid iron conduit or electrical metallic tubing
- 3 1¼-in. ells or angle fittings
- 1 1¼-in. entrance cap
- 3 locknuts and bushings
- 80 ft. No. 4 DBRC wire
- Misc. straps, expansion shields, tape and solder

Switch and Distribution Equipment

- 1 100-amp. 125–250-v. service switch or breaker
- 1 main distribution panelboard providing the following fusible or circuit breaker equipment:
- 1 3-pole main connection for No. 4 wire
- 1 60-amp., 3-pole range circuit
- 1 30-amp., 2-pole circuit for each bathroom heater, future water heater, and laundry hot plate
- 9 lighting and appliance branch circuits
- 2 100-amp.; 2 60-amp.; and 6 30-amp., fuses
- 9 plug fuses (unless circuit breaker is used)

Labor—65 additional man-hours' labor were lost through the failure to provide an adequate wiring layout in the average home.

202 man-hours would now be required to install these outlets in the present average home

(These labor values are based on armored cable branch circuit wiring methods, and a rigid conduit service)

alone is seen from the fact that if only one per cent of our 22,000,000 existing homes were adequately rewired, we would employ over 22,000 wiremen during the entire year.

The additional cost of rewiring a completed home for adequacy indicates the difficulty in selling adequacy in any but our new homes. More than ever is it a reminder that it is the industry's obligation to sell adequate wiring before the home has been completed.

Essential Adequacy Provisions Which Were Found Lacking In All Eight Homes

- Range Wiring
- Kitchen Ventilation
- Kitchen Clock Outlet
- House-to-Garage Lighting Control
- Basement Switch Pilot
- Protective Lighting
- Concealed Telephone Wiring Raceways
- Bathroom Heaters
- Approved Iron Outlets
- Electric Dishwasher
- Concealed Radio Outlets

Additional Conductor Footage Required For Special Wiring

	Range 3-No. 6	Bath No. 1 Heater 2-No. 12	Bath No. 2 Heater 2-No. 12	Telephone 1st & 2nd Flr. ½-in. Flex.	Garage 3-Way Control 2-W	Garage 3-Way Control 3-W	Two Protective Lights 3-Ways 2-W	Two Protective Lights 3-Ways 3-W
Home No. 1.....	18 ft.	15 ft.		65 ft.	25 ft.	64 ft.	64 ft.	49 ft.
Home No. 2.....	40 ft.	50 ft.		29 ft.	none		32 ft.	52 ft.
Home No. 3.....	36 ft.	51 ft.		30 ft.	none		80 ft.	21 ft.
Home No. 4.....	33 ft.	38 ft.	57 ft.	35 ft.	14 ft.	40 ft.	77 ft.	20 ft.
Home No. 5.....	48 ft.	29 ft.	61 ft.	55 ft.	22 ft.	32 ft.	85 ft.	18 ft.
Home No. 6.....	28 ft.	56 ft.		34 ft.	16 ft.	44 ft.	70 ft.	33 ft.
Home No. 7.....	32 ft.	47 ft.		81 ft.	23 ft.	51 ft.	78 ft.	24 ft.
Home No. 8.....	36 ft.	43 ft.	63 ft.	91 ft.	21 ft.	60 ft.	87 ft.	27 ft.
Average Home....	**34 ft.**	**41 ft.**	**60 ft.**	**53 ft.**	**20 ft.**	**49 ft.**	**82 ft.**	**31 ft.**

The Inadequacy Found in Eight Occupied Homes

	Home No. 1			Home No. 2			Home No. 3			Home No. 4			Home No. 5			Home No. 6			Home No. 7			Home No. 8			Average of 8 Homes		
Area	1320 Sq. Ft.			1758 Sq. Fr.			1656 Sq. Ft.			2800 Sq. Ft.			2200 Sq. Ft.			1980 Sq. Ft.			2100 Sq. Ft.			3011 Sq. Ft.			2103 Sq. Ft.		
Outlets	Now Installed	Adequacy Standard	Lacking	Now Installed	Adequacy Standard	Lacking	Now Installed	Adequacy Standard	Lacking	Now Installed	Adequacy Standard	Lacking	Now Installed	Adequacy Standard	Lacking	Now Installed	Adequacy Standard	Lacking	Now Installed	Adequacy Standard	Lacking	Now Installed	Adequacy Standard	Lacking	Now Installed	Adequacy Standard	Lacking
Ceiling Fixtures	14	18	4	8	22	14	16	22	6	21	33	12	21	34	13	17	25	8	13	26	13	10	25	15	15	25	10
Wall Fixtures	14	21	7	13	20	7	9	15	6	17	35	18	12	27	15	7	13	6	29	37	8	20	28	8	14	24	10
Convenience Outlets	9	36	27	10	42	32	22	44	22	22	63	41	17	54	37	13	44	31	3	50	47	13	48	35	14	48	34
Switches Single Pole	11	16	5	8	23	15	6	14	8	5	30	25	12	29	17	7	19	12	8	12	4	5	20	15	8	20	12
Switches 3-Way	2	10	8	0	16	16	4	14	10	2	18	16	2	12	10	2	12	10	2	12	10	2	10	8	2	13	11
Switches 4-Way	0	1	1	0	2	2	0	1	1	0	5	5	0	1	1	0	1	1	0	1	1	0	0	0	0	1	1
Branch Circuits	4	7	3	2	8	6	4	8	4	3	10	7	4	9	5	4	8	4	3	9	6	4	11	7	3.5	9	5.5
Outlet Totals	50	102	52	39	125	86	57	110	53	67	184	117	64	157	93	46	114	68	55	138	83	50	131	81	53	131	78

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First Adequate Wiring Program Bringing Results in North Carolina

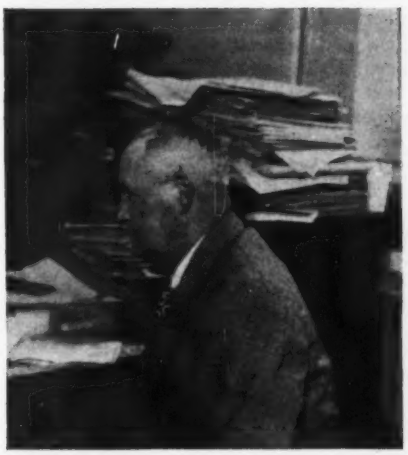
The first attempt on the part of any community to put into effect the adequate wiring standards of the electrical industry has been in progress throughout the state of North Carolina for the past three months.

THIS activity has a unique background, in that its initial impetus is being attained through its detailed presentation to the public by the North Carolina Chapter of the International Association of Electrical Inspectors. These standards encompass not only adequate residence wiring, but include a very clear and understandable outline of procedure for adequate wiring in commercial, industrial and institutional occupancies.

Here then is a program which places the inspector in direct selling contact with the builder, architect and owner. His equipment consists of a manual, with which to couple his own practical knowledge, in approaching the problem of guiding the planner or buyer of a wiring job. The fact that within sixty days after launching this program there had been nearly 100 jobs conform with these minimum standards has lent encouragement to its sponsors. These projects involved homes, schools, stores and public institutions scattered over the state. The public has been found receptive to the efforts of non-commercial educational assistance.

Realizing that confusion within the ranks of those attempting to take a leading part in this work would weaken the plan, a careful analysis of reasonable standards for adequate wiring was made by the National Electrical Manufacturers Association, under the direction of Arthur L. Abbott, manager of the consulting and advisory division of its uniform legislation department. A 30-page manual was compiled by Mr. Abbott, and upon presentation before the January meeting of the North Carolina Chapter, I.A.E.I., was endorsed.

A liberal quantity of these manuals was immediately made available to all who were interested. Regardless of the community from which a member came, the program could be carried on there without confusion or contradiction by statements that might originate in a neighboring town or community. Architects having commissions in outlying communities would be approached on the same uniform goal of adequacy provisions by each person who might contact them, whether contractor, inspector or utility engineer.



N. E. Cannady, Electrical Engineer and Inspector, Insurance Department of North Carolina. Mr. Cannady was responsible for initiating the North Carolina adequacy movement.

The aim in compiling the "Manual of Adequate Wiring" was to provide information which could be used by the practical man as well as the engineer, and which would be used by the architect in planning his wiring for modern standards of adequacy. Since the gradual upward trend in lighting intensities has so frequently over-taxed the average wiring job, it was deemed important to provide in this manual a handy reference guide for lighting systems. Accordingly a set of tables was incorporated in the manual which give standard loads for general illumination in commercial, public and industrial occupancies. These tables are worked out on the basis of watts per square foot, and are followed by explanatory sections dealing with branch circuit and feeder layouts, and sample specifications.

By employing the values that are set forth in these tables, together with the recommended circuiting and feeder provisions, it is then a practical procedure on the part of an inspector, architect or contractor to arrive at sensible adequacy values which should meet the requirements for future occupancy without the need of expensive alterations to the wiring system.

Selling the Plan

The first step toward placing this program in operation involved the enlistment of the electrical inspectors in each community. This was largely done during the

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January meeting, when the manual was officially endorsed. Additional field work was done throughout the state by N. E. Cannady, electrical engineer and inspector for the insurance department of North Carolina, with the cooperation of Mr. Abbott. Meetings were held with members of the industry in several of the principal centers, and explanations were made about the use of the manual. As a result of this work, the three leading utilities operating in the state volunteered their assistance. Each of their branch managers was given a supply of manuals, and was instructed to become familiar with the use of them, and to contact all persons or firms who were known to be engaged in new construction or remodelling work.

Direct Results from North Carolina Activity

While no specific compilation of the various projects is as yet available, nearly 100 jobs are claimed to have been let on the new basis of adequacy. Reports have been received from several localities which have some bearing upon the state-wide interest that is being taken. Several examples are:

A Raleigh hospital addition employed the manual layout, resulting in increasing the feeder capacity from No. 2 to 2/0 cables.

Two schools at Henderson are being wired per manual.

A leading architect of the state has adopted the manual standards for his program of school work and other projects.

Durham reports a new residence in which the wiring layout exceeded the manual standards.

Several buildings at the State Fair grounds are being rebuilt after destruction by fire, all employing manual wiring layouts.

Rocky Mount reports several jobs now under way, employing manual wiring standards.

Asheville also has had some jobs employing adequacy provisions.

Winston-Salem reports show three commercial jobs, and ten residence jobs under way on the manual basis. In one case the inspector went over the architect's head, and the owner accepted manual adequacy provisions, with the outlets being just double the original layout.

Several utilities have made up a reprint of the two pages pertaining to residence wiring. This is sent to any prospective home builder in their territory, with an invitation to call upon them for any help in planning the wiring requirements.

The state university is reported to have placed the Manual of Adequate Wiring in its curriculum with certain scholastic credits.

Mr. Cannady sent out over 300 manuals to contractors and inspectors in March, each accompanied by an official letter of explanation, and also a supplementary set of tables which illustrated the losses that are sustained through improper voltages. One table dealt with six graduated steps of low voltage applied to a 300-watt 115-volt lamp, while the second table covered the voltage, lighting efficiency and power losses sustained in a fully loaded No. 14 wire circuit.

Inspectors in several cities of North Carolina have already found that it pays to look up the architect before construction work is commenced, and particularly before bids have been obtained on the electrical work. Therefore they have established a new routine, namely that of getting in touch with the proper parties as soon as possible after they learn about a new construction project. Since it is the custom in most of the cities for a temporary water connection to be requested at the outset of operations, the reports of such requests of the water department are found helpful in getting early leads about new jobs.

After sending out letters to builders and architects in Winston-Salem, N. C., H. J. Flynt, electrical inspector of that city found that there was no great difficulty in getting favorable consideration of the adequate wiring plan. Since these letters went out as soon as information was received to the effect that a building project was being started, the next step involved a personal call as soon as possible thereafter. This call resulted in a presentation of the manual, an explanation of its intent toward insuring permanent values of adequacy, and the efficient use of the wiring system free of troublesome overloads and possible hazards.

It was discovered by Mr. Flynt that the architect favors a concrete plan which can be resorted to as being sponsored by a non-commercial agency. The very nature of its completeness, yet also its simplicity, makes it possible to be referred to in substantiating a higher-priced wiring layout. Furthermore the adherence to this set of standards leaves the architect free of all possible criticism by the client in future years, while the higher first cost is not regarded by the client as being promoted by the architect in the interest of larger fees.

While the manual in its present form is highly regarded by all who have been active in its presentation and use, it is reported that several additional sections are to be worked out later on. The present data covers only lighting systems, and the supplements are planned to follow similar simplified forms for use in connection with motor wiring, underfloor systems, signalling equipment, etc.

Mountain States Plan $50,000 Business Building Program

The Electrical League of Colorado and the Rocky Mountain Electrical Association, embracing Colorado, New Mexico and Wyoming, have perfected plans to spend $50,000 during the next twelve months in developing the electrical business in those states. The budget includes $3,225 to be spent on lighting promotion, and $2,225 on electrical cooling, wiring and power sales promotion.

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Correct Switching
Will Cut Down the Light Bill

Sell "a path of light before and no wasted light behind."

MODEL homes have been built to show correct lighting, ample outlets, but it remained for the recent Magic House exhibit at Kansas City, Mo., for a house to be designed with switches placed to obtain "a path of light before, leaving no wasted light behind." In a six-room bungalow 55 switches were used. The attendants in showing this house drew the visitors' attention to the switching, explaining that "It's the light we waste that counts."

The features of the switching as shown in the plan were as follows:

Radio Switch at Telephone: Quick silencing of the radio at the moment one answers the telephone is secured by a radio control switch located in the telephone niche. Another switch at this point controls a recessed light that floods down upon the telephone instrument dial.

Dual Intensity Light Control: A continuous cove lighting trough was installed around the four dining room walls, wired in two circuits. Each circuit was provided with 3-way switch control at the two entrances, thus providing one-half or full intensity illumination control from the most convenient point of entrance to the room.

Stumble Light Switch: "Stumble light" or "night lights" were plugged on the upper half of a duplex receptacle at opposite ends of the living room with switch control for the upper receptacle, the lower half being left "hot." Thus a soft flood of light could be left to shine on the floor of this room without the use of portables or the larger fixed units.

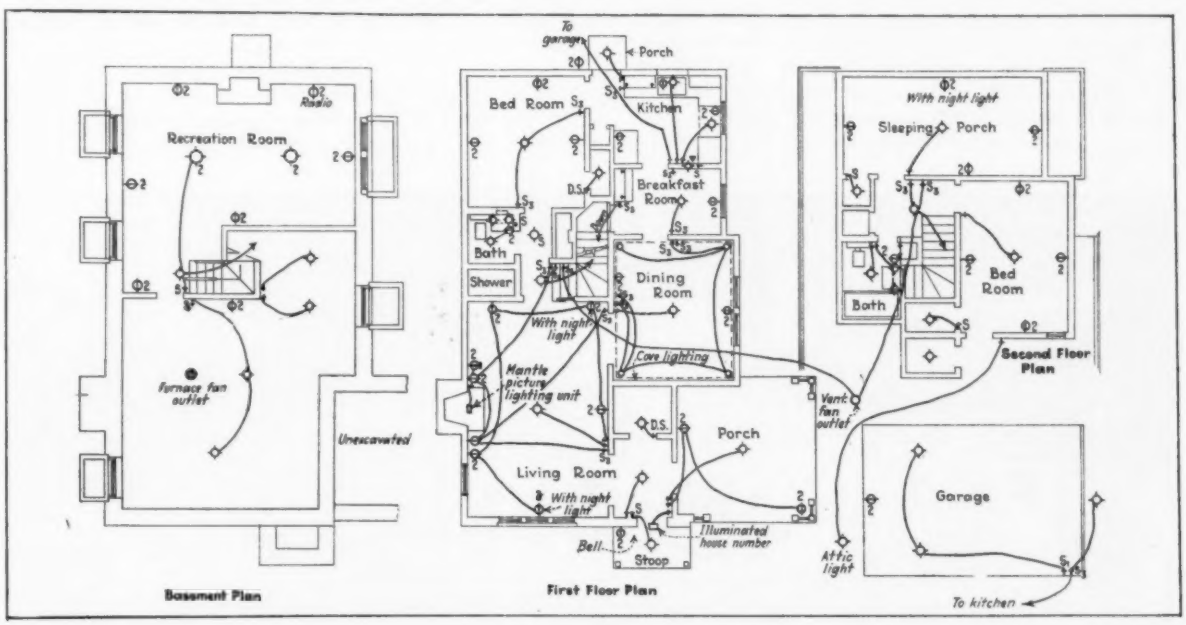
Attic Exhaust Fan: Three-way switch controls were provided in the upper stair landing between the bedroom and sleeping room, and in the passageway between living room, first floor bedroom and bath.

Garage Lighting: A driveway reflector was 3-way switched within the garage, and at the rear entrance of the home. An additional switch controlled two lights within.

Other Three-Way Control: At opposite entrances to breakfast room, kitchen, first floor bedroom, basement and recreation room stairway, and the first floor to second floor stairway.

Living Room Light Control: Three points of control were provided for entering and leaving the living room, (1) at front entry vestibule, (2) at dining room archway, and (3) at combined stair hall and hall to first floor bedroom and bath.

Some of the special single controls were: Illuminated house number; front porch convenience outlets; front porch ceiling fan; three separate basement outlet switches for (a) furnace light, (b) washing machine light, and (c) general illumination; two switches per bathroom for the separate control of (a) side panel mirror lights, and (b) ceiling sun lamp; automatic closet door switches; separate control of (a) built-in soffit light above kitchen sink and (b) kitchen work shelf.



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A Home Safety Program

by Paul Ferneding

President Eastern Section, International Association of Electrical Inspectors.

IN commercial and industrial buildings inspectors have very little difficulty making reinspections, but in the home—that's different. How can the home be reached?

When one sees the mounting number of fires from electrical causes, when one learns that the deaths from electricity have exceeded seven hundred in one year, when one sees the vast amount of cheap and shoddy material being offered to the public, when one realizes the rapidly growing volume of electrical material that the public is purchasing to install themselves in their homes, there must come a realization of the vital necessity of doing something to improve home wiring conditions.

The quickest, easiest and most effective course is public education.

To be most effective, of course, such a program should be essentially non-commercial, and for that reason should, where possible, be headed up by an inspection authority. Since the program will need a certain amount of money, it will be necessary to have local industry support.

The things to be covered in a home safety campaign are:

1—The hazards
2—How to make the home safe electrically
  A—National Electrical Code
  B—Ordinances and state laws
  C—Approved material (Underwriters' Laboratories)
  D—Approved installation (Inspection)
  E—Approved workmanship (Licensed contractors)
3—Relation of inspector to the public
4—Why reinspection
5—Why bootlegging is bad
6—Relation of adequacy to safety
7—Obsolete material

In bringing this subject to the public's attention, use can be made of:

Booklets and literature
Newspaper releases
Advertising
Lectures
Radio
Exhibits and displays

The means for getting this information and education to the public are:

Schools
  Short talks as a part of school safety work
  Prize essays
  Check up and report by pupils on home wiring
Local association talks
  Parent teachers associations
  Luncheon clubs
  Church associations
  Fraternal organizations
  Business and trade associations
Window displays by banks, dealers, contractors, utilities
Exhibits at fairs, conventions and exhibitions
Envelope stuffers with electric light bills
Leaflet with every lamp and appliance sale
Prepared newspaper interviews to be used by papers on off days

The International Association of Electrical Inspectors has been experimenting with several parts of this program in different cities, and is accumulating a fund of practical experience. It is now in a position to advise any community that wishes to take up this work and offer practical suggestions.

The display shown with this article is the one developed by this organization. It is made in sections so that as much or as little may be used as space permits.

Besides this standard display, the association has developed interviews for the newspapers as well as a series of promotional letters.

Where, and How High, Should an Outlet Be

To Provide Greatest Convenience

by Lillian Eddy
Home Lighting Specialist,
General Electric Company, New York, N. Y.

THE average woman upon entering a room devoid of furnishings immediately visualizes the logical places for furniture and the ways in which the room will be utilized by the members of her family. Because this is so simple a matter to her, it is beyond her conception why electric outlets are frequently so illogically placed by the builder. The necessary alteration of her furniture plan to avoid a misplaced wall bracket, the crawling on hands and knees to attach the vacuum cleaner to an outlet behind a large piece of furniture and the fumbling in the dark for switches, have become such everyday experiences to her that she has come to believe that the person who plans her wiring system either does not know the requirements of the present day home, or that there is something so mystical about installing wires behind walls that outlets cannot be in convenient locations. Either she resigns herself to awkward installations or, what is far more serious, attempts to change the system by means of homemade unapproved wiring.

The Adequate Wiring Standards for Residence Buildings adopted in 1932 by the electrical industry cover the subject of numbers of outlets, branch circuits, wire sizes, etc. Here no attempt is being made to discuss the subject of adequacy. Many adequate installations are inconvenient due to the placing of outlets without due regard to the ways these outlets will be utilized by those living in the house. To tabulate the exact location of electric outlets in every residence would be a gigantic task as structural differences and special uses to which some outlets are placed, call for variations from any set rule. However, if a few general principles are adhered to, electric service in the home would be more convenient and because of their logical placement, additional outlets could be more easily sold.

Wall Brackets:—From a general placement standpoint the outlet for a wall bracket should never be placed in the center of a wall space that would be occupied by a tall piece of furniture, a picture or other wall hanging. In rooms where the standard candle type fixture is to be used the outlet should be 5 ft. 6 in. from the floor. If the urn type indirect wall fixture is specified the outlet should be 6 ft. from the floor so as to render the lamp bulb invisible to occupants of the room and to produce better illumination. Bathroom outlets located at either side of the mirror should follow the 5 ft. 6 in. rule where the socket of the fixture turns down; where it turns up, mount the outlet 5 ft. from the floor in order to keep the light source near the face. Wall brackets placed to illuminate local work areas in kitchens, at work benches and the like, follow the 5 ft. 6 in. rule unless structural conditions call for variations. Exterior outlets for lanterns may

Outlet Mounting Height Guide

Outlets	Living Room Dining Room Sun Porch Bedroom Hall	Kitchen Breakfast Nook Laundry Bathroom	Exterior of House	Garage Workshop
Wall Brackets				
a. candle type	5 ft. 6 in.	5 ft. (bathroom)	.....	.....
b. socket down	5 ft. 6 in.	5 ft. 6 in.	5 ft. 6 in.	.....
c. socket up	5 ft. 6 in.	5 ft. (bathroom)	5 ft. 6 in.	.....
d. indirect urn	6 ft.	.....	.....	.....
Ceiling Light	Center of room	Center of room	Center of porch between steps and door	Over car engine. Over work bench
Wall Switches	48 in. from floor 3 in. from door trim	48 in. from floor 3 in. from door trim	.....	48 in. from floor, 3 in. from trim
Convenience Outlets				
a. Portable Lamps	3 ft. 16 in. from floor	40 in. from floor	2 ft. from ground	40 in from floor
b. Small Appliances				
1. Clocks	6 ft. from floor (unless outlet in mantel-piece)	6 ft. from floor	.....	.....
2. Fans	6 ft. 6 in. from floor	6 ft. 6 in. from floor	.....	.....
3. Irons	.....	40 in. from floor	.....	.....
4. Refrigerator	.....	40 in. from floor	.....	.....
5. Washing machine	.....	40 in. from floor	.....	.....
6. Vacuum cleaner	40 in. from floor or in wall switch plate	.....	.....	.....
7. Floor	1 ft. off center of dining room	.....	.....	.....
8. Heavy duty	.....	40 in. from floor	.....	.....

Electrical Contracting, May 1935

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be guided by this same rule unless the architecture of the house demands a different location.

Switches:—Upon entering a house for the first time, the finding of a wall switch is a great hunting game, whereas a standard location for switches would eliminate this annoyance. Assuming the switch is correctly placed on the door opening side of the doorway entering the room, it should always be mounted 48 in. from the floor and 3 in. from the door frame. The three inches takes it far enough away from the wood trim for convenience, yet keeps it close enough to eliminate the constant cleaning of finger prints on the wall caused by fumbling fingers in the dark.

Three Outlet Classes

Convenience Outlets:—The convenience outlet is such an audacious offender in this matter of logical placement of outlets that its name has become a joke to the average homemaker. Let us again assume that an adequate number of convenience outlets are to be installed and that these are being placed in useful wall spaces and not on short lengths of wall where furniture could never be used. At what height should the outlet be located? From the standpoint of height, convenience outlets fall into three classes—those 3 to 16 in. from the floor, those 40 in. from the floor, and those in special locations for clocks, fans, heavy duty appliances and the like.

The first classification of outlets in or near the baseboard applies to convenience outlets used primarily for portable lamps and used in the living room, sun porch, dining room, hall, and bed room. A variation in height is permitted here to cover sectional practice and personal preference. From the decorative viewpoint the outlet should always be in the baseboard where it is least conspicuous and where the wall finish is least apt to be marred from use of the outlet. A cord draped from a 16-in. outlet to a floor lamp is unsightly and causes an extra stumbling hazard for children who romp around furniture. Some people prefer to forego the appearance for the slight added convenience of an outlet easier to reach at an increased height.

The second classification of convenience outlets located near the working plane applies to those installed primarily for small electric appliances in the kitchen, laundry, bathroom, workshop, etc. The 40-in. mounting height is the most practical as the outlet is generally used in conjunction with a table or work shelf. The standard kitchen table or work shelf varies in height from 32 to 36 in., therefore the 40-in. location precludes the possibility of the outlet coinciding with the table top or workshelf edge. This height is also convenient for the attachment of bulky appliances such as the washing machine or ironer, and if a pilot light is included with the outlet, it is not obstructed from view by the appliance. In the bath room this same height outlet becomes equally useful for curling iron, immersion heater, portable room heater or other uses particularly where there are children.

The third classification of convenience outlets applies to the vast number of special outlets being installed as a result of the extended development and use of appliances in the home. Each outlet could be discussed at length. Always keep in mind the specific use for which the outlet is designated and install it for the convenience of the user rather than the convenience of the electrician on the job.

Thus it is apparent that wall outlets for clocks should be 6 ft. from the floor. In the living room the clock is generally placed on the mantelpiece. Use a standard duplex outlet mounted in the center of the mantelpiece and countersunk 2 in. so the clock stands level. When no clock is used, the outlet is not conspicuous. Fan outlets should be 6 ft. 6 in. from the floor to raise the fan above the heads of those occupying the room. The location of ventilating fan outlets will be determined by the structural conditions. Radio outlets follow the same rules as convenience outlets for portable lamps. The vacuum cleaner outlet may be incorporated with the wall switch at the room entrance or located in an inconspicuous place in the wall 40 in. from the floor. The floor outlet in the dining room is best located about 1 ft. off the center point of the floor area so as not to coincide with the center leg of the dining room table. In large living rooms floor outlets are required, especially in the vicinity of the fireplace. Where one outlet is installed, locate it 5 ft. out from the center of the fireplace; where two are installed, locate them 5 ft. out from each end of the hearthstone. Very large rooms will require different locations of floor outlets which can only be determined by a careful study of the room plan.

The heavy duty outlets provided for the electric range and water heaters should be readily accessible. Again follow the 40 in. mounting height unless otherwise specified because of special style of appliance being installed.

The location of ceiling outlets offers no special problem. Single outlets are centered with the room. Where more than one outlet is installed, they are equally spaced in the ceiling area. A few special ceiling outlets require attention. An outlet to illuminate the kitchen sink should be centered over the sink. Ceiling outlets in the celler are required in front of the furnace, over the laundry trays and over the work bench. Other basement ceiling outlets for storage areas and the like, may be centered with the area to be illuminated.

In the average one or two car garage the ceiling outlet is best located over the space to be occupied by the engine portion of the car.

A Guide

The growing popularity of exterior decorative illumination and electric appliances for gardeners demand exterior convenience outlets. These weatherproof outlets should be located at the junction of foundation and wall construction, or not less than 2 ft. from the ground. The height of the outlet makes it more accessible through the shrubbery generally found growing about the house.

The tabulation on the preceding page was designed to serve as a general guide in placing outlets at the proper mounting heights. For exceptions that necessarily creep into any such generalizations, one must be guided by common sense. In other words, it is only necessary to consider where and how the outlet is to be used and its logical and convenient location follows automatically.

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The new sales approach to house lighting is higher foot-candle intensity interpreted to the customer in terms of—

1. Better Housekeeping

Better light—better sight—better cooking, sewing, dishwashing, cleaning, furnace tending, etc. In other words, more and better placed light will help people do their household tasks better and easier. Insufficient and poorly placed light causes poor work and exasperation, bad disposition, unhappiness. These are things the public can understand and will buy. This method of selling lighting to factories is proving equally successful in the home.

2. Eye Conservation

When 23 per cent of those under 20 years, 39 per cent of those under 30 years, 48 per cent of those under 40 years, and 82 per cent of those under 60 years have defective vision, everything must be done to conserve what is left. Many of the household tasks such as sewing, knitting, studying, reading, writing, require close concentration and need lots of light. Parents will pay most any price to conserve the eyesight of their children.

The lighting values in the table below give the recommended illumination intensities for different rooms in order to minimize eye-strain and provide adequate vision.

3. Safety

Poor light causes one to stumble against chairs, step on toys, etc.; fall against things in the attic or the cellar, trip on the stairs, particularly the cellar stairs. One good fall can cost many times the price of adequate light. The public will buy safety when it might economize on other things.

4. Beauty and Comfort

Up to recently most home lighting was sold on this basis. It still is a powerful sales argument when used with the preceding points. Poorly lighted rooms look dark and dingy. Such rooms are unpleasant and uncomfortable. One of the least expensive and most effective ways to make such rooms pleasant and comfortable is better lighting. A relighting job can do almost as much as a refurnishing job—and at much less expense.

Recommended Lighting Intensities for the Home
(Approved by the Illuminating Engineering Society)

	Foot-candles
Reading	
Prolonged periods with fine type	20-50
Ordinary reading	10-20
Sewing	
Fine needle work on dark goods	100 or more
Prolonged average sewing	50-100
Prolonged sewing on light goods	20-50
Ordinary sewing on light goods	10-20
Writing, ordinary	10-20
Card playing	5-10
Children's study table	20-50
Dining room (when used for ordinary reading or writing rather than for ordinary dining)	10-20
Kitchen	
General	5-10
Local at work counters and sink	10-20
Bedroom, general	2-5
Bed light	10-20
Dresser, vanity and dressing table mirrors*	10-30
Sewing machine	20-50
Bathroom mirror*	10-30
Children's playroom	
General	5-10
Local	10-20
Stairways and stair landings	2-5
Work bench	10-30
Ironing machine, ironing board and laundry trays	10-20

*Intensity value delivered on each side of face.

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Cheap Wiring Devices

Can Be Expensive

The alternative to shoddy merchandise is not necessarily the most expensive—and in the long run the Contractor comes out ahead.

THERE is hardly a contractor who has not been obliged to return to a job, months after it was supposedly completed, to repair or replace defective material. The cost in labor, material and transportation constitutes one of the large leaks from the contractor's till.

One of the most frequent causes of recall to a job is defective wiring devices. Switches, sockets, receptacles and other wiring devices are afflicted with a wide variety of possible ailments, depending largely upon the care with which they are manufactured.

The contractor who buys solely on price, to whom a "switch is a switch," is faced with two difficulties. First, he must realize that the very cheapest devices cannot be built with any attention to quality; and second, when he finally has trouble with such devices, he finds that there is no guarantee back of the goods. The cost of replacement for both labor and material, therefore, comes out of his own pocket.

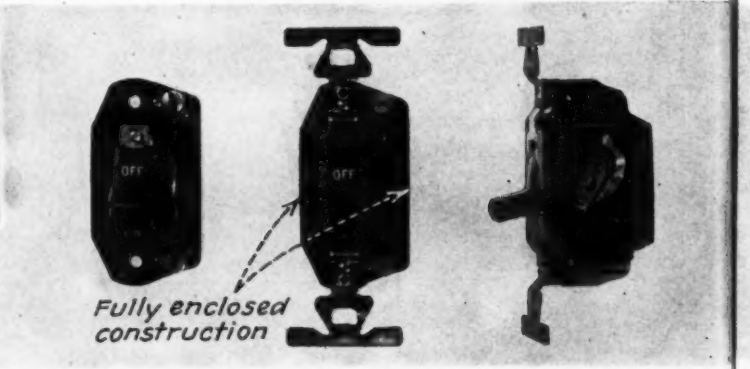
The alternative to shoddy merchandise is not necessarily the most expensive. Conditions in a skyscraper are obviously different from those in a Tennessee Valley home, and a sound rule of reason can be applied to each typical case. To reduce this problem to its simplest terms, the wiring devices in a normal six room house having a total of 62 outlets, of which 42 include wiring devices, have been priced in four separate price ranges. In each case the total net contractor's cost per item is given with footings showing the grand total for each class of material. For purposes of comparison, it has been assumed that the contractor receives a discount of 40 per cent from list. The material listed in the four price columns, may be described as follows:

Cheapest Material. Here are the lowest priced wiring devices obtainable. It is rather difficult to get exact prices on this grade because quotations vary so; but the figures are sufficiently accurate for our purpose, and probably are lower than any contractor can consistently expect to get. It is interesting to note that

TWELVE CHECKING POINTS

Observance of these points when buying wiring devices may save contractors considerable money in the long run

1. Do they have plaster ears?	Plaster ears are found only in the standard and highest grades. They make a firm backing for plate. Without them devices have to be built up with washers to plaster line. Extra labor costs can eat up entire price saving.
2. Is metal thick enough for tapping?	Where metal is too thin to hold full threads, as is frequently the case with cheapest grade, threads are stripped, requiring either additional tapping or new devices—extra labor in any event. The better the device the heavier the metal.
3. What kind of material is in the blades and contacts?	Steel is not approved by Underwriters' Laboratories. It is short lived and does not carry current well. Check for positive contact and adequate area. Phosphor bronze or similar metal gives longest life. Short life blades and contacts mean replacements which cost considerable in labor.
4. Are screws large enough?	Small heads will not hold wire securely, causing lost labor in trying to make wire "stay put." Standard and highest grade screws will accommodate wires larger than No. 14.
5. How positive and fast is switch action?	The cheaper the switch the more sluggish the action, resulting in shorter life. Real short life, as in the cheapest line, means costly replacements.
6. Is assembly rigid and in alignment?	To secure positive contact assembly must be rigid. Looseness indicates possible defective alignment and failure to make contact even when new. Replacements are expensive.
7. Can slots be used with both tandem and parallel blades?	The two cheaper grades cannot be used with tandem blade cord caps and the very cheapest in many cases are not polarized.
8. How are casings made?	Casings are easily broken if the porcelain or bakelite is thin.
9. How many binding screws?	If terminals have only one binding screw labor will be lost making wire splices where circuit continues beyond receptacle.
10. Are plate screw holes centered?	Unless properly centered along mounting yoke, labor will be lost in installing and leveling plate.
11. Are slot finders provided?	The better grades of receptacles have slot finders which are a convenience to the user.
12. How strong are switch handles?	Thin handles break easily, causing expensive replacements. Check also for large and easily read "OFF" and "ON" lettering.



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in the case of the combination switch and receptacle there is no really "cheap" item available. In each class, therefore, the price is for an assembly of switch, pilot and plate made up from one of the several so-called interchangeable lines now on the market.

Competitive Priced Devices. This material is the answer of the better manufacturers to price-built merchandise. It is sold under special trade names to distinguish the competitive line from the standard line. While it cannot be said that this material carries the same guarantee as the standard line, three facts are worth noting.

First, these devices are designed and built in factories accustomed to quality production. Second, the manufacturers are constantly testing this material both electrically and mechanically. Third, so long as a user does not expect expensive performance at the low prices indicated, the manufacturers are inclined to make good on any legitimate complaint.

Reference to these prices shows that the difference on the average house wiring job is hardly enough to cover the transportation of a man to make good a defect, let alone pay for his time.

Standard or Medium Priced Devices. The costs in this column cover what might be called "standard" material. A comparison between the competitively priced receptacles for instance, shows several vitally important differences. The standard devices have plaster ears, and "T" slots, to accommodate either tandem, parallel or polarity blade cord caps; binding screws have large heads, and the entire construction is rugged. In contrast, the cheaper devices have no plaster ears, and are equipped with parallel blade slots only.

Highest Grade Devices. This sort of material is rarely used in residences, except those of the most expensive class, but a comparison would not be complete without including the costs in the table. Switches are specially designed for Type C lamp circuits. The receptacles are top-wired, with such high-class internal construction that the jaws grip the blades of a cord cap like the proverbial bulldog. The costs in this column also include brass plates, .060 gauge. In the other columns bakelite plates are figured. If bakelite plates were used instead of brass, the net total cost would be $13.70, which is very little more than for the standard line.

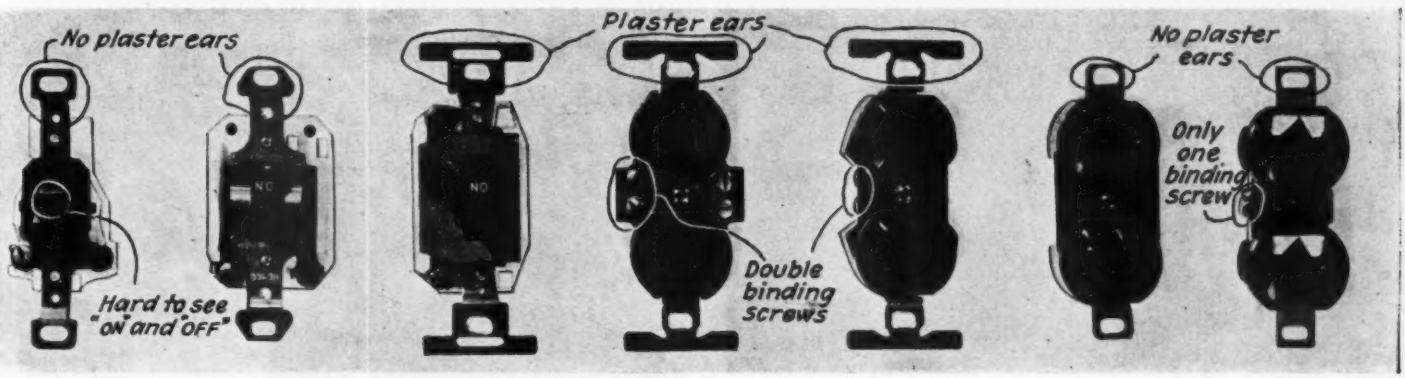
So far as the "Highest Quality Devices" are concerned, their use is not ordinarily justified in typical residential work. For use in commercial buildings, banks, stores, etc., the argument is reversed, and the great weight of engineering opinion is behind their exclusive use.

Now which to use? The answer has been "the cheapest" in so many cases that the idea of quality as a foundation for goodwill, plus freedom from after-the-job-is-over expense, seems to have received scant consideration. Yet when the reduction in material cost is so small that total saving is not equal to the cost of a single recall, it is apparent that little thought has been given to all of the cost factors involved.

A study of the twelve points to be investigated when buying wiring devices will show that in almost every case where the material has been skimped, or parts left off that the contractor has to use a greater amount of time in installing the device. This analysis will help the contractor to determine whether or not he really saves any money by buying cheap wiring devices, and if it is worth taking the risk of wasting a lot of money replacing cheap devices just for the sake of a possible small original saving.

Contractor's Net Cost of Wiring Devices of the Different Grades for an Average House

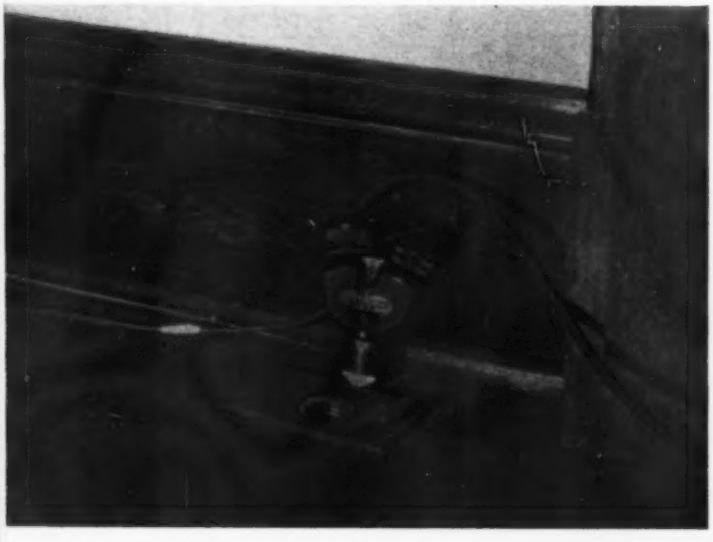
Quantity	Device	Cheapest	Competitive Priced	Standard or Medium Priced	Highest Quality
1	Switch, pilot, lamp and plate	$ .39	$ .86	$ .86	$ .93
22	Duplex receptacles	1.19	1.68	3.61	5.07
11	Single pole switches	.66	.90	2.12	5.14
4	3-way switches	.57	.63	1.20	2.38
1	4-way switch	.96	1.68	1.68	1.87
14	1-gang switch plates, bakelite	.55	.71	.71	.....
1	2-gang switch plate, bakelite	.08	.10	.10	.....
22	1-gang receptacle plate, bakelite	.86	1.11	1.11	.....
1	Pull chain lamp receptacle	.11	.16	.16	.82
2	Keyless lamp receptacles	.14	.18	.18	.93
14	1-gang switch plates, brass	.....	.....	.....	1.86
1	2-gang switch plate, brass	.....	.....	.....	.27
22	1-gang receptacle plates, brass	.....	.....	.....	2.93
	Total	$5.51	$8.01	$11.73	$22.20



House-to-Rent Su

Living Rooms 66% have two or less convenience outlets
13% have no switches

Dining Rooms 19% have no convenience outlets
23% have no switches



34% of homes still have screw receptacles

ESSENTIAL WIRING INCONVENIENCE

CONVENIENCE OUTLETS

NONE		ONLY ONE	
Living room	2%	Living room	24%
Dining room	19%	Dining room	58%
Bedrooms	43%	Bedrooms	38%
Kitchen	13%	Kitchen	81%

WALL SWITCHES NONE

Living room	13%
Dining room	23%
Bedrooms	77%
Kitchens	72%
Bathrooms	79%

3-WAY SWITCHES

None	23%
None for garage	81%
None 1st to 2nd floor	15%

PILOTS

For flat iron	none
For cellar stair lighting	none

INCONVENIENT AND OBSOLETE WIRING

Kitchen old style pendant chain one lamp fixture. 45%

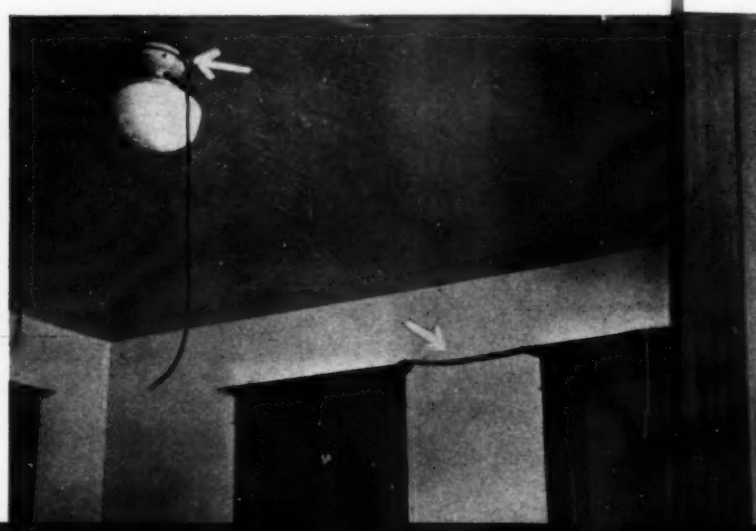
APPLIANCE OUTLETS

No iron outlet	17%
No refrigerator outlet	85%
No washer outlet	66%

BATHROOM

Ceiling fixture only	23%
Bracket over mirror	15%
Bracket one side of mirror	32%
Bracket both sides of mirror	30%

58% of homes have permanent cord wiring



UMI

Survey Shows Vast Market

Additional wiring is greatly needed to bring houses-to-rent up to normal electrical convenience.

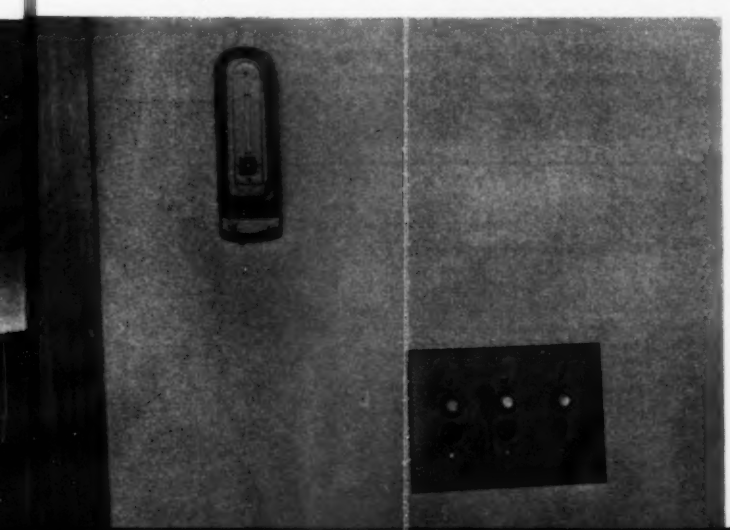
A MEMBER of Electrical Contracting's editorial staff investigated 53 houses now being offered for rent in eleven cities in New York and New Jersey, to determine not how much these houses lacked adequate wiring, but what was needed just to bring them up to normal electrical convenience. The investigator also noted the extent to which obsolete wiring was still being used.

Houses of all sizes up to six bedrooms, and renting for from $35.00 to $275.00 were visited. The average was slightly over three bedrooms each, at an average rental of just under $60.00 a month.

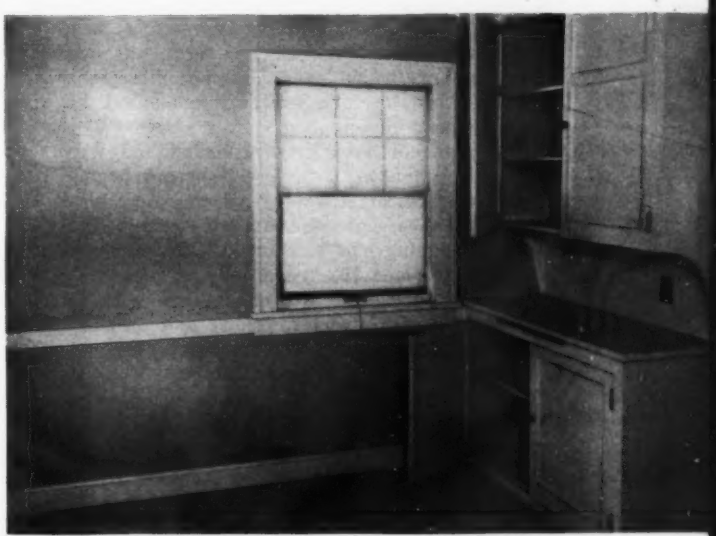
The conditions found are summarized as follows:

Obsolete or Unsafe Wiring	
Screw receptacles (These averaged 4.2 each for the 18 houses that had them)	34%
Rotary flush switches (These averaged 2 each for houses that had them)	11%
Push button switches (These averaged 5 per home for the 30 that had them)	52%
Homes with shock sockets	64%
Homes with permanent cord wiring (Average of 2.7 outlets in cord wiring)	58%

52% of homes still have push button switches



Bed Rooms — **43% have no convenience outlets**
77% have no switches



Kitchens — **85% have no refrigerator outlet**

Bathrooms — **79% have no wall switch**
70% have poor lighting

UMI

Adequate Wiring Makes Outlet Pricing Method Dangerous

The many conditions that may be met on a modern residential job can so substantially affect outlet cost as to render the outlet pricing method highly uncertain

by Ray Ashley

THE practice of figuring residential work at so much per outlet, which has been in fairly common use ever since electric light was introduced into homes, while not exact, has nevertheless been an acceptable, satisfactory estimating method, provided standard conditions applied.

As the use of electricity expanded and wiring became more extended, it became apparent to many contractors that all outlets were not the same in installation cost, and so separate units were set up for switch, receptacle, ceiling and bracket outlets.

And now comes the trend toward adequate wiring which means more circuits and outlets with attention to additional uses, special circuits and special outlets. It is obvious that under such conditions the practice of figuring by the outlet is suicidal.

The several conditions, any one or all of which might be met on a modern residential job, that can so substantially affect outlet costs as to render that method impossible are:

1—Special circuits
2—Special outlets
3—Cost of materials, especially wiring devices
4—Number of outlets per circuit
5—Size of the circuit
6—Exacting measurements and character of construction
7—Complicated switching
8—Necessity of working along with other trades.

1. *Special circuits:*—Some of the special equipment for which special circuits must be run that will be encountered in modern, well designed homes are:
Kitchen and Attic Ventilators
Built-in Bathroom Heaters
Concealed and Built-in Lighting
Air conditioning, Heaters, Stokers, etc.
Outdoor Lighting
Built-in Appliances and Controls
Alarms
Range and Water Heating
Radio Wiring
Extra Telephones.

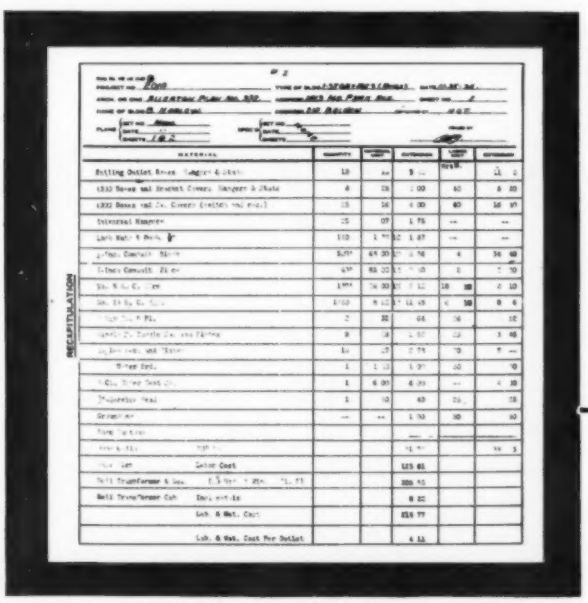
2. *Special Outlets:*—In addition there are special purpose outlets which take longer to install than the ordinary receptacle such as: Clock outlets, fan outlets, radio outlets, power outlets for bench tools, outdoor outlets.

3. *Cost of Materials:*—While the principal effect is in the material cost, it may or may not affect labor. Cheap devices might take longer to install than devices more amply designed. On the other hand, high priced devices might have the psychological effect of causing greater care in lining up, etc.

4. *Number of Outlets per Circuit:*—Obviously, if the same number of outlets is divided among more circuits, the cost per outlet is going to be greater.

5. *Size of Circuit:*—Adequate wiring calls for larger circuits than the Code requires in order to provide for the future. This increases the cost per outlet.

6. *Exacting Measurements and Character of Construction:*—In an ordinary residence, a fraction of an inch or sometimes a few inches in locating an outlet does not matter, but where the outlets have to conform to the measurements for ornamental plastering, special paneling, or tile formation, it is imperative that outlets be located within a small fraction of an inch. To


RECAPITULATION

Estimate No. 1. $4.11 per Outlet

This represents the estimate for the simplest type of one story residence, as prepared by a contractor who is doing a large number of similar wiring jobs. The cost per outlet runs low for both labor and material. The material is not of the highest grade and the labor is not involved.

accomplish this often requires a great deal of time, not only for installing the work, but for studying plan details. Many details are not worked out in time for the contractor to complete his work as he goes along. Outlets in narrow bases, or along trim may involve considerable scheming in order to get the work in. Then there are studio living rooms or wood paneled rooms, high tiled bathrooms and kitchens, brick and stone houses with outdoor switch and light outlets.

7. Complicated Switching: — Outlets switched alternately or on three and four-way switches require more material per outlet, and more labor for installation. The labor increase is both for the additional material, and for the time used in poling up. Some of the switching requires the conduit to be run from floor to floor.

8. Necessity of Working Along With Other Trades:— The nature of the work is such that in many instances the electrician must work along with the tile setter, plasterer or carpenter. This means that the electrician has practically no control over his work, but must be limited to the speed of other trades.

It may be necessary to make special trips back to the job, to install occasional outlets which could not be put in when the main "roughing in" was going on. The writer has known cases where 25 per cent of the labor cost for "roughing in" was spent after 90 per cent of the outlets had been installed.

In spite of the difficulties encountered, high class residence work is desirable. The contractor must figure his labor according to the job so that he can accept such delays stoically, and be willing to make small changes without quibbling. Most architects handling the better classes of work are anxious to have their contractors make a reasonable profit.

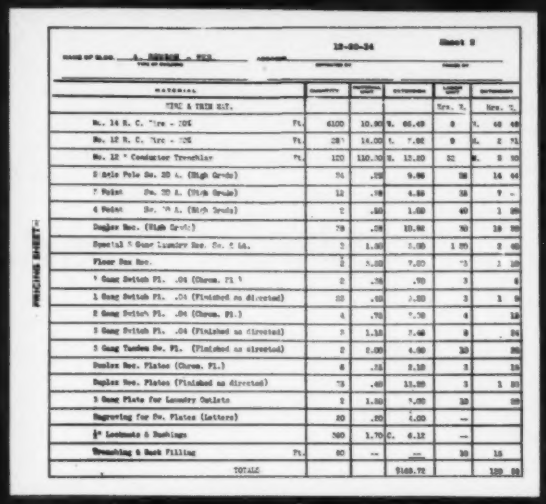
To indicate how dangerous it would be to bid all residence work on an outlet price, two jobs are here priced. One is a bungalow of standard construction, while the other is a larger house of more expensive construction and using better materials.

Although the prices used in the two estimates are not adaptable to any particular locality, or makes of materials, the percentage variation shown should apply generally. It will be noted that the approximate increases in costs per outlet of the second job over that of the first are: Material 120 per cent, and labor 60 per cent, combined labor and material 90 per cent.

The material increase is due principally to the use of galvanized conduit, 30 per cent wire, high grade switches and receptacles, special panels and cabinets, and a liberally designed installation. The analysis of the labor increase is not so simple. It is impossible to cover all of the factors which may be responsible for this increase, but the discussion alone of the items which affect outlet costs will cover the salient points.

Estimate No. 2. $7.56 per Outlet

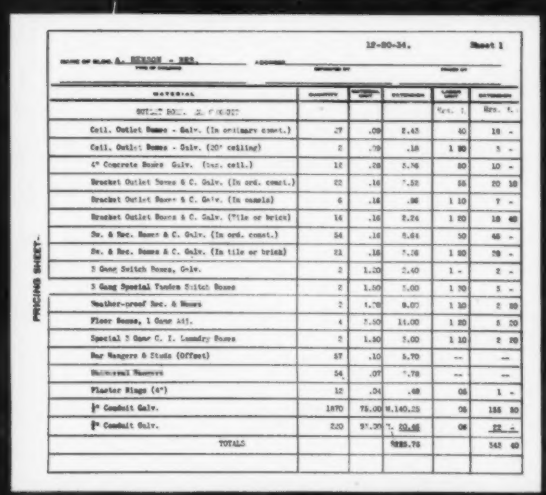
This represents the estimate for a high class residence with the best grade of materials specified. The labor for installing the wiring in such a building will be much greater than that required for the ordinary residence. There will be exacting measurements to follow and much time will be lost waiting for other trades to complete their work.



PRICING SHEET—

12-20-34 Sheet 2

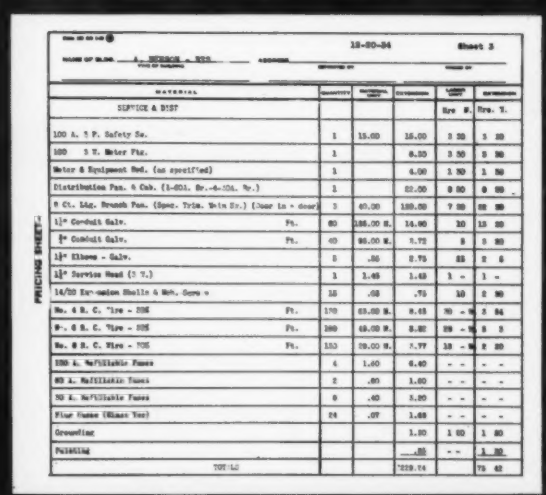
MATERIAL	Quantity	Material Unit	Material Extension	Labor Unit	Labor Extension
TRIM & TRIM MAT.				Hrs. U.	Hrs. T.
No. 14 R. C. Wire - TWH	Ft. 6100	10.00 M.	61.00	0	0
No. 12 R. C. Wire - TWH	Ft. 2811	14.00 M.	7.02	9	2 71
No. 12 " Conductor Trenchlar	Ft. 1200	110.00 M.	13.20	32	9 60
2 Arm Pole No. 20 A. (High Grade)	24	.52	9.96	36	14 64
7 Point No. 20 A. (High Grade)	12	.78	4.56	36	7 -
4 Point No. 20 A. (High Grade)	2	.50	1.00	40	1 20
Duplex Rec. (High Grade)	78	.28	10.92	30	19 50
Special 5 Gang Laundry Box. No. 5 Ga.	2	1.30	2.60	1 20	2 40
Floor Box Rec.	2	3.50	7.00	3	1 50
1 Gang Switch Pl. .04 (Chrom. Pl.)	2	.78	.70	3	6
1 Gang Switch Pl. .04 (Finished as directed)	22	.45	9.90	3	1 32
2 Gang Switch Pl. .04 (Chrom. Pl.)	4	.70	2.80	4	16
2 Gang Switch Pl. .04 (Finished as directed)	3	1.10	3.30	8	24
3 Gang Tandem Sw. Pl. (Finished as directed)	2	2.00	4.00	30	60
Duplex Rec. Plates (Chrom. Pl.)	6	.35	2.10	3	18
Duplex Rec. Plates (Finished as directed)	78	.40	31.20	3	3 90
3 Gang Plate for Laundry Outlets	2	1.50	3.00	30	60
Engraving for Sw. Plates (Letters)	20	.20	4.00	--	
½" Locknuts & Bushings	500	1.70 C.	6.12	--	
Trenching & Back Filling Ft.	80	--	--	30	15
TOTALS			9168.72		129 60



PRICING SHEET—

12-20-34. Sheet 1

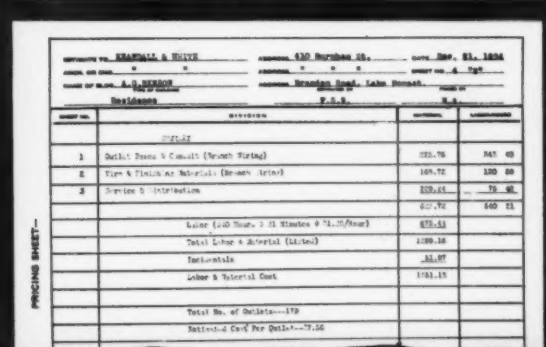
MATERIAL	Quantity	Material Unit	Material Extension	Labor Unit	Labor Extension
OUTLET BOX.				Hrs. U.	Hrs. T.
Ceil. Outlet Boxes - Galv. (In ordinary const.)	27	.09	2.43	40	18 -
Ceil. Outlet Boxes - Galv. (20' ceiling)	2	.70	1.40	1 30	3 -
4" Concrete Boxes Galv. (Ind. ceil.)	12	.28	3.36	80	10 -
Bracket Outlet Boxes & C. Galv. (In ord. const.)	22	.16	3.52	55	20 10
Bracket Outlet Boxes & C. Galv. (In canvis)	6	.16	.96	1 10	7 -
Bracket Outlet Boxes & C. Galv. (Tile or brick)	16	.16	2.24	1 20	19 40
Sw. & Rec. Boxes & C. Galv. (In ord. const.)	54	.16	8.64	50	45 -
Sw. & Rec. Boxes & C. Galv. (In tile or brick)	21	.16	3.36	1 20	25 -
3 Gang Switch Boxes, Galv.	2	1.20	2.40	1 -	2 -
3 Gang Special Tandem Switch Boxes	2	1.50	3.00	1 70	3 -
Weather-proof Rec. & Boxes	2	4.75	9.50	1 30	2 60
Floor Boxes, 1 Gang Adj.	4	3.50	14.00	1 20	5 20
Special 5 Gang C. I. Laundry Boxes	2	1.50	3.00	1 10	2 20
Bar Hangers & Studs (Offset)	37	.10	3.70	--	--
Universal Reducers	54	.07	3.78	--	--
Plaster Rings (4")	12	.04	.48	05	1 -
½" Conduit Galv.	1870	75.00 M.	140.25	05	155 50
¾" Conduit Galv.	220	97.50 C.	20.46	06	22 -
TOTALS			9225.78		342 60



PRICING SHEET—

12-20-34 Sheet 3

MATERIAL	Quantity	Material Unit	Material Extension	Labor Unit	Labor Extension
SERVICE & DIST				Hrs U.	Hrs. T.
100 A. 3 P. Safety Sw.	1	15.00	15.00	3 30	3 30
100 3 W. Meter Fbr.	1		8.50	3 50	3 50
Meter & Equipment Rod. (as specified)	1		4.00	1 50	1 50
Distribution Pan. & Cab. (3-021. Br.-4-20A. Sw.)	1		22.00	8 00	8 00
8 Ct. Lig. Branch Pan. (Spec. Trim. 3-Wire Sy.) (Door in - door	1	40.00	180.00	7 00	28 00
1½" Conduit Galv. Ft.	60	186.00 M.	14.90	20	12 00
¾" Conduit Galv. Ft.	40	86.00 M.	3.72	8	3 20
1½" Elbows - Galv.	3	.55	2.75	25	2 5
1½" Service Head (3 W.)	1	1.45	1.45	1 -	1 -
14/20 Rx-cuion Shells & Mch. Screw	16	.05	.75	10	2 00
No. 4 R. C. Wire - TWH Ft.	170	53.00 M.	9.45	70 - M	5 84
No. 6 R. C. Wire - TWH Ft.	200	45.00 M.	9.00	80 - M	5 5
No. 8 R. C. Wire - TWH Ft.	153	39.00 M.	5.97	10 - M	2 20
100 A. Refillable Fuses	4	1.60	6.40	- -	- -
60 A. Refillable Fuses	2	.80	1.60	- -	- -
30 A. Refillable Fuses	2	.40	3.80	- -	- -
Fine Fuses (Glass Tue)	24	.07	1.68	- -	- -
Grounding			1.00	1 00	1 00
Painting			.50	- -	1 00
TOTALS			7229.74		75 42



PRICING SHEET—

ESTIMATE TO KNOWALL & WHITE ADDRESS 430 Burnham St. DATE Sep. 21, 1934

CHECK OR CONT. " " ADDRESS " " " " SHEET NO. 4 TOT

NAME OF BLDG. A. G. HERRON ADDRESS Brandon Road, Lake Forest.

Residence F.O.B. B.A.

SHEET NO.	DIVISION	MATERIAL	LABOR AND MISC.
	OUTLET		
1	Outlet Boxes & Conduit (Branch Wiring)	223.76	342 60
2	Trim & Finish as Material (Branch Wiring)	169.72	120 60
3	Service & Distribution	229.25	75 42
		622.73	540 62
	Labor (450 Hours, 1 31 Minutes @ $1.20/Hour)	675.41	
	Total Labor & Material (Limited)	1298.14	
	Incidentals	11.87	
	Labor & Material Cost	1761.15	
	Total No. of Outlets---172		
	Estimated Cost Per Outlet---7.56		

Electrical Contracting, May 1935

UMI

Prize Winning Home Modernization Display

Attractive display booths offer an ideal means of presenting home modernization possibilities.

A DISPLAY booth which was sponsored by the Charlotte Electrical Association was awarded first prize for being the most practical industry display of all exhibitors who participated in the Home Modernization Show which was held at Charlotte, N. C., during the week of April 6. Sixteen electrical contractors, six wholesalers and the local power company cooperated in the exhibit.

The convenience, comfort and unusual functions to be derived from intelligent electrical modernization planning and new home wiring was made appealing to the public. Four booths were arranged side by side to appear similar to the end of the living room, dining room, bath room and kitchen. Doors were provided in the room partitions so that realistic 3-way switching convenience could be demonstrated. Among the items incorporated in this display were:

1.—Chimes installation to replace the old bell-and-buzzer.

2.—Front and rear door chime push buttons, with combination push-button illuminated plates.

3.—Built-in telephone cabinet with flush niche light for consulting telephone directory.

4.—Range receptacle set out from behind the range, so as to be accessible for inspection.

5.—Recessed clock outlet, featuring the concealment of cord.

6.—(Not visible in photograph, to left of clock). Built-in kitchen ventilator with the flush switch control featured as eliminating pull cord wear and lint gathering.

7.—No-fuse lighting panel in kitchen. One circuit was provided with a placarded wall switch for short-circuit demonstrations, to show the convenience and simplicity of resetting a tripped-out circuit.

8.—Bathroom mirror side lighting example, stressing the disadvantage and inconvenience of one light above mirror.

9.—Convenience receptacle in the bathroom, with an immersion heater on hand for demonstration.

10.—(Not visible in photograph). Bathroom electric air heater.

11. Miniature model cut-away residence for demonstrating attic ventilation.

12.—(Not visible in photograph). Basement lighting control and pilot light advantages.

13.—Iron receptacle, pilot light, switch and cord reel.

14.—Outdoor protective lighting outlets provided beyond the end partitions with a control switch and pilot placed near the bed-side lamp stand.

15.—Three-way control for garage lighting prominently located in the kitchen wall.

16.—(Not shown in photograph). Weather-proof decorative lighting outlet placed in the partition opposite the living room.

17.—The generous spacing of convenience outlets was self-evident, however, some surface metal raceway ex-

tension was provided in addition as an example for difficult structural conditions.

18.—Two Better Light-Better Sight demonstration reading boxes tied in with the modern residential lighting installation.

All items were neatly placarded with briefly lettered cards, with no make or brand of material being advertised in the booth. The complete wiring job included a standardized service and outdoor meter housing.

The complete booth has been moved to the sales floor of the local power company where it will occupy a permanent and prominent floor space. Attendants will be kept available to explain any features of the exhibit to visitors.

"Bring 'em Back Alive"

by JOHN WISE

Frank (Bring-Em-Back-Alive) Buck's business is supplying live, healthy beasts, birds and reptiles to zoos and circuses. To make successful captures and insure a profit, he has to use efficient and ingenious methods. I just saw one of his movies and there's an education for anybody in the way he works. Naturally, the rarest specimens are the hardest to find and catch. So Mr. Buck has to think up snares that are clever and won't injure the animals, as damaged goods are not salable in this game.

A lot of experimenting is necessary; sometimes a good trick will succeed only after several failures. Again, many different ways will be tried on one animal till the right one clicks. Some stunts will work in one case and fail in another. Buck got his clouded leopard by shooting off the limb it crouched on. But when he tried the same on the giant orang-utan, the old slicker just moved to another limb, and they had to make a special cage-trap, which got him in five minutes.

One of Frank's cleverest traps is also one of the simplest, and there's a lesson in it. That is the way he captured some rare monkeys, lemurs. First, he cut a hole a little larger than a half-dollar in one end of a coconut, and fished out the meat. The empty shell was then anchored to a stake with a cord and some rice poured inside. When a bunch of these traps were placed, the monkeys, investigating, would stick their hands into the coconut and grab a fistful of rice. Then they couldn't get their fists out, and by golly! rather than let go the precious rice, they just squealed and pulled and jumped around till Buck and his boys grabbed them.

Applied to our selling of wiring, in competition with others of equal standing, the lesson I get from Frank Buck's trick is to put a different slant on my proposition to the prospect by creating or emphasizing some special inducement, so attractive that he just won't be able to let go of it. Of course, each contractor will have to think up his own inducement; in many cases it will be something he has been giving with his work but failing to cash in by featuring it. If he uses a better material, glassware or some other improved article, that is valuable. Then there may be his own pet methods of wiring which give the customer a better job for convenience, ease of operation and possible extension of the system. Some contractors offer a written guarantee which gets away from the stereotyped form. Inspection service and periodical check-ups are other tempters.

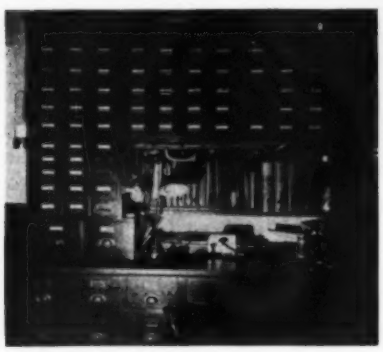
Whatever it is, it should fit in so well that it sticks in the prospect's mind all during the sale, as something he has been wishing for. This is not a new idea, smart salesmen are using it everywhere, but we certainly need to be reminded of it.

UMI

Construction . . Methods . . . .

Saving Steps for Stock Clerks

Many valuable small items of stock can be kept in their properly labeled compartments and within easy and quick reach of the stock room clerk as a result of remodeling a drawer

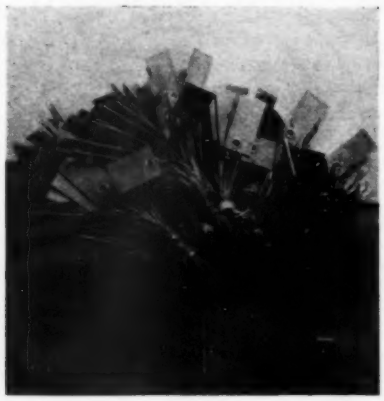


case in the office of Baldwin-Stewart Electric Co., Hartford, Conn. The lower right-hand sections of this case were removed to provide a niche to accommodate catalogs. The flat ledge serves as a desk top, while the removal of half the bottom section at the right side allows leg-room to permit its use for regular desk work.

Permanent Cable Labels

A lasting method for marking large numbers of feeder cables in splicing or pull boxes was employed by the Stevens-Fitch Co., New Haven, Conn., for their work at Yale University. Sheet fibre of 1/16 in. thickness was cut in 1 in. by 2 in. pieces and provided with ¼ in. diameter brass eyelets and 16-gauge bare solid copper tie wires. Numbers and initials were stamped into the fibre to correspond with a general system feeder designation schedule, this work being done by hand with dies.

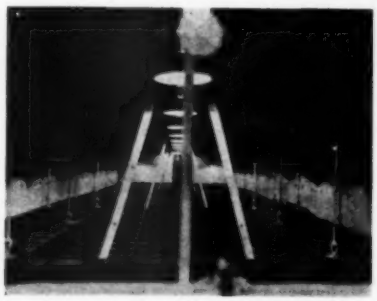
The above method was chosen for permanency, since the stampings will remain legible for many years, the tie wires will not deteriorate,



and there are no ink markings to fade out or become blurred due to moisture or handling. The fibre material likewise can cause no trouble if its edges should at some time puncture the insulation, and thus come in contact with the conductor.

Wiring for Sky-Light Illumination

The installation of conduit for a large number of outlets above the glass panels of a sky-light must be done with extreme care to avoid the possible breakage of expensive glass during installation, and to provide a



rigid system which will eliminate the need for future repairs or maintenance in such areas. In designing the layout for several sky-lights in a large Cleveland department store, the Martien Electric Company made a detailed scale drawing of each area, from which the exact spacings were determined so that all lengths of conduit could be cut and threaded before commencing work in the area. The steel roof supporting members were punched for conduit strapping bolts ahead of the conduit assembly operation. It was decided that there would be little economy in changing conduit and outlet fitting sizes, therefore 1¼ in. conduit and threaded fittings were used throughout, thus simplifying the erection of each run and assuring greater ease in pulling wire.

Twelve 500-watt RLM type reflectors and six circuits were provided for the center row of units, while the left and right rows each consisted of twelve 200-watt RLM type reflectors wired four per circuit. Connections were made so as to permit operating alternate outlets, thus providing full or half intensity upon the shoe sales floor areas, which are about 25 ft. below the sky-light panels. A remote controlled panelboard was installed equipped with two contactors, one for each group of circuits.

Waist-High Conduit Bending

A practical mounting method for conduit benders permits these tools to be placed "waist-high" for most efficient leverage. This eliminates stooping, and thereby lessens human effort. A rigid clamping assembly is provided which permits quick attachment to various sizes of concrete or steel "H"-columns, so that the bend-

ing crew may be easily shifted from one floor or work-center to another. This mobility cuts down the need of carrying conduit about the job for great distances, or through crowded work areas. Outfits of this type are used by J. Livingston and Co., New York, N. Y.

A pair of 5-in. by 5-in. by 48-in. long angle-irons are bolted to the opposite column faces by means of ¾-in. bolts. These bolts have extra thread length for accommodating the variations of columns. The wide flange of angle-iron used provides sufficient

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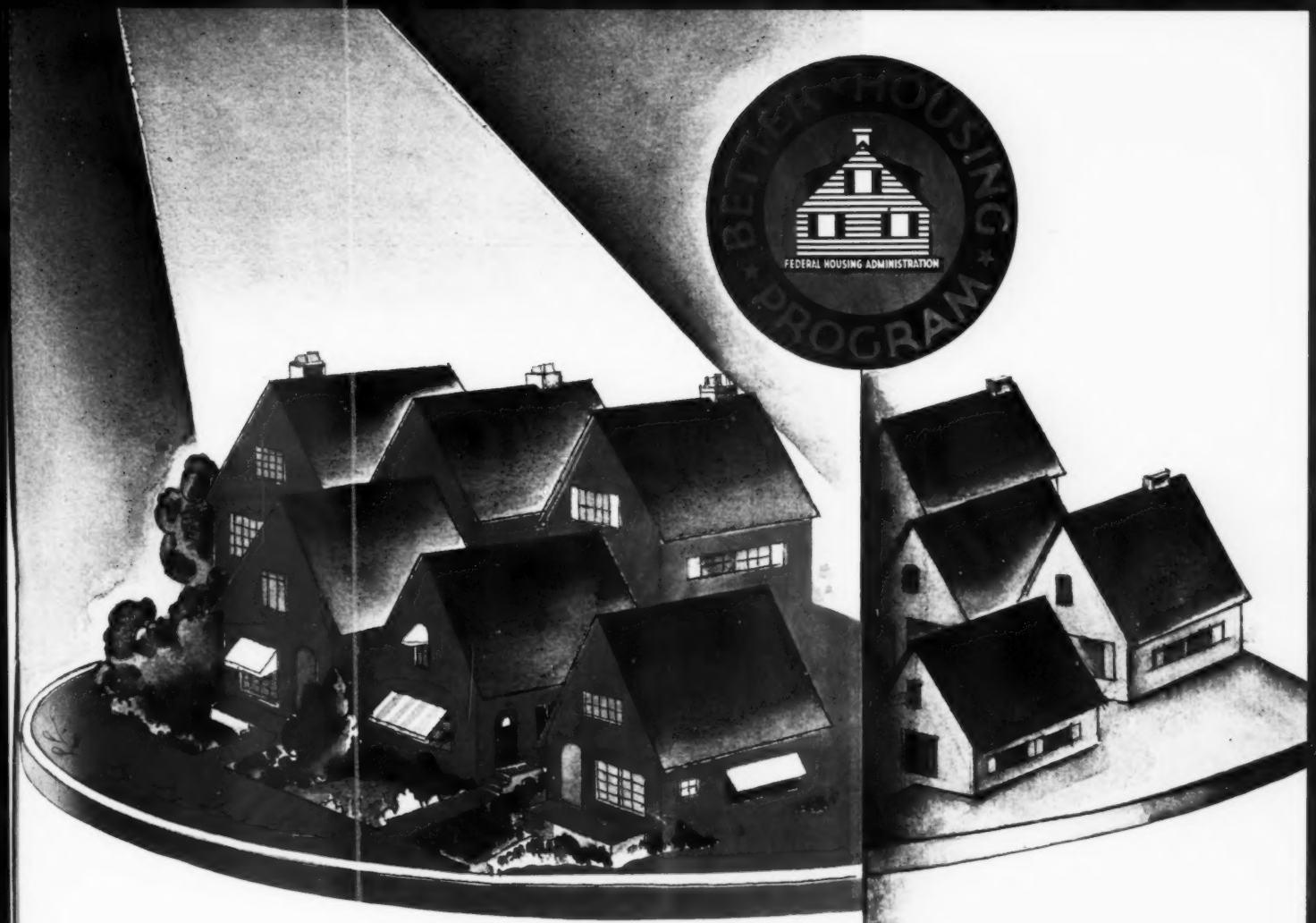


6 out of 10

are GOLDEN OPPORTUNITIES for You

Electrical Contractors . . . Golden opportunities surround you. 6 out of 10 homes in every neighborhood are inadequately wired. They need electrical repair work . . . new switches, convenience outlets, circuits.

Find the Golden Homes . . . Sell them the comfort, convenience and safety that General Electric Wiring Materials can bring. Do more business at a greater profit . . . with G-E Wiring Materials. Golden opportunities surround you!

GENERAL ELECTRIC

WIRING MATERIALS

UMI

CREATE YOUR OWN

6 STEPS THAT GET YOU INTO THE 6 HO

1 Capitalize on the Product. Every homeowner knows General Electric Products for their reliability, durability and economy. And you know how easily, quickly, and profitably G-E Wiring Materials can be installed. The whole line is made and guaranteed by the one great company. It's the unbeatable combination . . . FOR GREATER PROFITS.

2 Call upon every home and place of business systematically . . . house by house, street by street. Only by such a thorough check can you find the inadequately wired houses that need you. You have got to prove to these homeowners that their wiring system is inconvenient, if not dangerous . . . "Why" and "How" it should be corrected.

3 Get into every home. Equip your brief case with a 3-Way Switch Assembly; Twin Convenience Outlet Assembly; Switch with Pilot Light; Door Switch; piece of BX Cable; Building Wire; Conduit. Show the homeowner how these G-E Wiring Materials can make his home a better place in which to live. Examine the wiring system. Point out and list the inconvenient and dangerous elements. Suggest improvements.

GENERAL ELECTRIC

WN OPPORTUNITIES

6 HOMES AND GIVE YOU BIGGER PROFITS

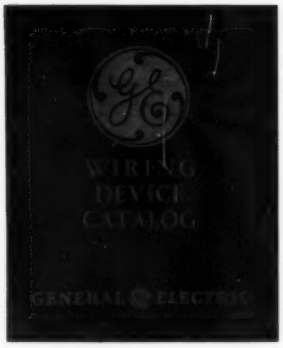
4 Before leaving a home, make a definite appointment for a return call. Go to your office and draft up a plan of the suggested improvements. Sell the prospect the electrical convenience, comfort and safety that you can build into his home. Sell this plan and G-E Wiring Materials to make BIGGER PROFITS NOW.

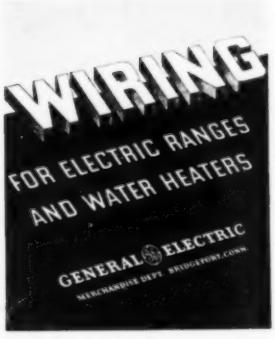
5 The Federal Housing Administration can help you. Go to your local FHA Office and find out exactly the conditions under which homeowners may obtain loans. They may be used for remodeling electrical wiring systems. Explain FHA thoroughly and carefully to the homeowner. *On that explanation may depend the whole job.*

6 Sell your valuable services and G-E Wiring Materials . . . at a PROFIT. Don't wait for the homeowner to come to you. Most of them have become used to their out-moded wiring systems. They do not know the convenience, comfort and security that you can build into their homes with G-E Wiring Materials. 6 out of 10 houses need YOU . . . And you need them for PROFITS in 1935.

WIRING MATERIALS

UMI





Mail This Coupon Today

Section CDW-485, Merchandise Department,
General Electric Company, Bridgeport, Conn.

PLEASE SEND ME THE CATALOGS AND PROMOTION MATERIAL LISTED BELOW.

The "G-E Contractor"—51-53 and 51-428.
Wiring Device Catalog—54-32-1.
Conduit Products Catalog—53-45.
G-E "Safecote" Code Wire Catalog Sheet—58-44.
G-E Building Wire Folder—58-43-1.
Wiring for Electric Ranges and Water Heaters—51-437.
FHA Broadside—51-433.
FHA Broadside—51-425.
Specification Sheet—Code Grade Wiring System—51-319-1.
Specification Sheet—G-E Supr-Kode Grade Wiring System—51-317.
Specification Sheet—G-E DeLux Grade Wiring System—51-318.
The Story of Comfort—51-3728.

NAME.....

ADDRESS.....

CITY.....

GENERAL ELECTRIC
WIRING MATERIALS

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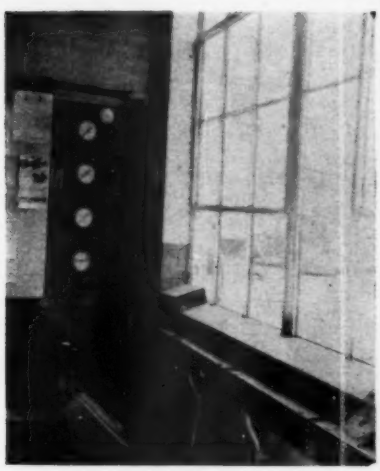
bolting ledge to permit the secure attachment thereto of a lever-type roller-and-shoe hand bender for 1-in. to 2-in. conduit.

This outfit is set up at a location where there is sufficient free walking space to allow the two-man bending crew a sweep of about 120 deg. around two faces of the column for a radius or distance of about 12 ft. away from column. For bending 1½-in. conduit the lever-man uses a 10-ft. length of 1¼-in. pipe for a lever, which has a 1-in. pipe telescoped within, to take up the spring or bending stress near the fulcrum point. The conduit that is being bent is fitted into the roller and shoe to the correct bend-spacing position by a second man, who supports the conduit while the bend is being made, and removes and stacks it upon completion. This bend fitter walks around the column, close to the bending machine, and ahead of the lever-man. This method is highly efficient for bending large quantities of home-run conduit stub-ups.

Neat Cramped-Quarter Wiring

A practical arrangement for providing connections to four electrically-heated units in the tire vulcanizing department of a new one-stop service station at Durham,



N. C., was recently designed and installed by the Durham Electrical Construction Co., of that city. Four power circuits were run in conduit from a power distribution panelboard to a wall-mounted wiring raceway. Each circuit was controlled by an individual automatic steam pressure switch. These were mounted beside the panel and connected with short nipples into the vertical portion of the raceway. The horizontal portion of raceway was extended

The Contractor's Share

—in this

AT no cost to you—but with many benefits accruing from your participation, you are asked to assume your part in the "Safeguarding Electric Service in the Home" campaign. Around this movement, based on the need for demanding approved, labeled cord and other devices, is growing the whole "Safety in Wiring" program. And results are showing in the public's demand for safe electrical work—approved materials—high quality workmanship.

To participate, write for the literature—cooperate with your local inspection bureau—get your local civic and commercial organization to sponsor the activity . . . suggest that your local school board adopt an educational program to promote proper care of cords—discuss the campaign with your local trade groups.

Write today for your copy of the campaign . . . sent free.

INTERNATIONAL ASSOCIATION of
ELECTRICAL INSPECTORS
PUBLIC RELATIONS COMMITTEE
85 JOHN STREET, NEW YORK CITY

F.H.A. is in the

EVERY T

we have said about the use
in developing new WIRING BU
SIX BILLION DOLLAR F.
in HOMES and SCHOOLS

BY the time this announcement reaches your eye 12 great regional programs of the Federal Housing Administration will be under way—creating an unparalleled opportunity for the electrical contractor in every section of this country.

Of course this opportunity is being created simultaneously for the plumber, the painter, the

THE WIREMOLD ZONE

THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!

NUMBER 2 OF A SERIES ON WIRING OPPORTUNITIES

For instance, see how this neat WIREMOLD LIGHTING STRIP is opening up window lighting opportunities!

Why? Because the simplest system is the easiest to sell—and the most profitable to install.

WIREMOLD Lighting Strip may be installed in a jiffy—in any shape or size of window! And there are hundreds of windows that need it. Wise salesmen see that their contractor friends go after this timely business. DO YOU?

THE WIREMOLD COMPANY, Hartford, Conn.

THE WIREMOLD ZONE

THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!

NUMBER 6 OF A SERIES ON WIRING OPPORTUNITIES

SWITCH CONTROL!
FOR ADDED OUTLETS

No. 280 SINGLE POLE SWITCH

See how nicely Wiremold meets this common situation!

JUST another instance of that marvelous adaptability to all conditions and to all fields of wiring practice. That is why Wiremold has become the chief reliance of contractors who specialize in the modernization of existing wiring systems.

243 GENERAL UTILITY OUTLET

243A SPECIAL RADIO OUTLET

ABOVE—The amazing versatility of this fitting is merely a demonstration of the versatility of ALL Wiremold fittings.

AT LEFT—These two fittings may be used in Wiremold switch-control systems. They will help to solve many other wiring problems.

THE WIRE-MOLD COMPANY, Hartford, Conn.

THE WIREMOLD ZONE

THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!

NUMBER 3 OF A SERIES ON WIRING OPPORTUNITIES

BASEBOARDS!

An example of how Wiremold smoothes all obstacles in this field!

THE great beauty of the Wiremold system is that it gives the contractor A CHANCE TO USE HIS OWN GOOD JUDGMENT to the best advantage. He can utilize his skill and experience to the utmost.

Here, for instance, is an illustration of Wiremold versatility applied to baseboards. No contractor can ever tell what he will be up against on a baseboard job—but all wise contractors know that Wiremold will help solve the problem whatever it is.

And the same is true in every field of wiring practice.

CHOICE OF STRAIGHT EDGE OR CENTER LINE MOULDING

THE WIREMOLD COMPANY, Hartford, Conn.

UMI

WIREMOLD ZONE

THING

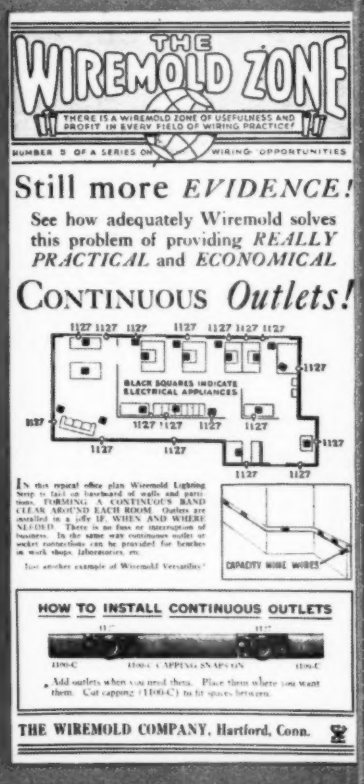
usefulness of Wiremold
BUSINESS applies to this
F.H.A. OPPORTUNITY
. . STORES and OFFICES!

roofer, the carpenter, etc., etc. And they will be hot after their share.

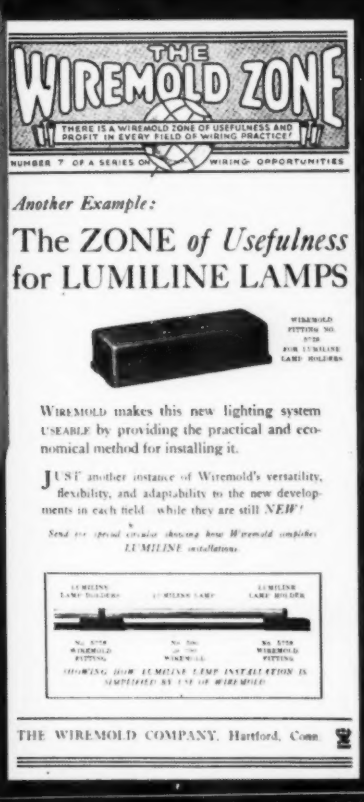
But you can get your share of this business if you will go after it with Wiremold.

Wiremold is the open door to this vast new market—because Wiremold makes wiring jobs easy to sell and easy to handle AT A PROFIT!

Remember what we have been telling you about Wiremold versatility—and act upon it.


THE WIREMOLD ZONE
THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!
NUMBER 3 OF A SERIES ON WIRING OPPORTUNITIES
Still more EVIDENCE!
See how adequately Wiremold solves this problem of providing REALLY PRACTICAL and ECONOMICAL
CONTINUOUS Outlets!
1127
BLACK SQUARES INDICATE ELECTRICAL APPLIANCES
CAPACITY WIRE WIRES
HOW TO INSTALL CONTINUOUS OUTLETS
1100-C
1100-C CAPPING SNAPS ON
1100-C
Add outlets when you need them. Place them where you want them. Cut capping (1100-C) to fit spaces between.
THE WIREMOLD COMPANY, Hartford, Conn.

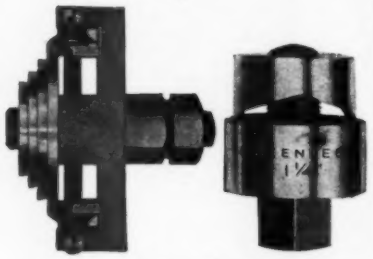
THE WIREMOLD ZONE
THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!
NUMBER 4 OF A SERIES ON WIRING OPPORTUNITIES
Example: See how Wiremold cleans up this
RADIO MESS...
BEFORE
AFTER
and creates . . .
NEW JOBS!
Here, too, Wiremold develops opportunity for new business!
ANTENNA WIRE
GROUND WIRE
POWER WIRES
RADIO PLUG
POWER PLUG
ANTENNA WIRE
GROUND WIRE
ANOTHER demonstration of Wiremold's great versatility and usefulness in meeting all conditions. Wherever there is a wiring problem you can always depend upon Wiremold for a simple, practical solution!
THE WIREMOLD COMPANY, Hartford, Conn.


THE WIREMOLD ZONE
THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!
NUMBER 7 OF A SERIES ON WIRING OPPORTUNITIES
Another Example:
The ZONE of Usefulness for LUMILINE LAMPS
WIREMOLD makes this new lighting system USEABLE by providing the practical and economical method for installing it.
JUST another instance of Wiremold's versatility, flexibility, and adaptability to the new developments in each field—while they are still NEW!
Send for special circular showing how Wiremold simplifies LUMILINE installations.
THE WIREMOLD COMPANY, Hartford, Conn.

Use MODERN TOOLS *for Modernization Work*

Better work and increased profits are the direct results of using modern tools, whether the job is large or small. And this is of special importance right now, with the number of modernization jobs in sight and the keen competition among contractors for them.

Be prepared to do modernization jobs with modern tools. They will give you an advantage over the contractor who still believes that a file is a good tool for enlarging holes for conduit. The Greenlee Tools shown here are all time and labor savers for bending conduit, boring holes, and enlarging holes in metal boxes, etc. Many users have reported that Greenlee Benders and Knockout Tools often pay for themselves on one job.



Greenlee Knockout Tools

These time savers are used for enlarging holes in outlet boxes, switch cabinets, etc. They leave clean, round holes, without filing or reaming. No. 735 Punch Set makes enlargements to fit ½, ¾, 1 and 1¼-inch conduit, and the No. 737 Set for 1½ and 2-inch conduit. No. 740 Cutter makes enlargements for 1½, 2, 2½ and 3-inch conduit.

Greenlee Boring Tools

For boring holes at high speed, use the No. 31 Electricians' Bit, which is known as the fastest boring tool on the market. It has a double-spur head for long life and a coarse screw point for fast feed. Other popular types of bits for the electrician are also included in the Greenlee line.

When an extra long reach is needed, a Greenlee Bit Extension is the ideal tool. The No. 900 will drive bits up to 1-inch diameter and is small enough to follow a ⅝-inch tool. A positive lock always prevents the bit from coming loose and being lost in the work. Made in a variety of lengths, and a larger size for bits up to 2-inch is also available.

Greenlee Hydraulic Conduit Benders

There is no substitute for a Greenlee Hydraulic Bender where conduit larger than 1-inch is to be bent. They are readily portable and are simple to operate, bending quickly and accurately, without distortion. The No. 770 Rigid Conduit Bender is shown above. It will handle 1¼, 1½, 2, 2½ and 3-inch sizes. The No. 775 bends 2½, 3, 3½, 4 and 4½-inch sizes.

Thin-Wall Steel Conduit is bent by fitting the No. 770 with attachments for that purpose. It is then known as No. 770-T and will make a full 90-degree bend with one complete forward movement of the ram, leaving a smooth, even curve. Attachments are for 1¼, 1½ and 2-inch thin-wall steel conduit.

Other Greenlee Tools include a Hydraulic Pipe Pusher, a Ball-Bearing Joist Borer, and other boring tools and chisels. Full information on the complete line will be sent gladly, without obligation to you. Just fill out the handy coupon and mail it today.

GREENLEE TOOL CO.
Rockford, Illinois

.....Mail This Coupon To-Day.....

GREENLEE TOOL CO., ROCKFORD, ILL.

Please send information on the following tools:

☐Rigid Conduit Benders ☐Thin-Wall Conduit Benders ☐Pipe Pushers

☐Knockout Tools ☐Joist Borers ☐Electricians' Bits ☐Bit Extensions

Name ..... Address .....

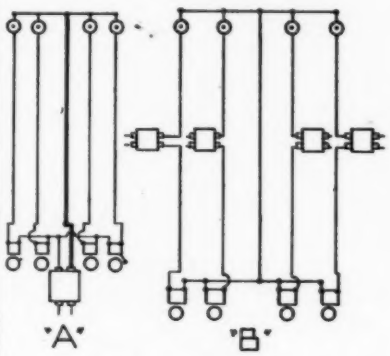
City ..... State .....

My Jobber is 5-35

along the side wall beneath a window sill to the last of four vulcanizing units, and branch circuits stubbed down from it to each vulcanizer connecting box. This method eliminates cross-overs of branch conduits and leaves a roomy wiring raceway that provides access for any future changes that may be found necessary.

Bell Transformer Connections

Remodeling jobs sometimes require changing the bell system from one transformer to individual transformers, but lack the means of adding wires. System "A" employs one original transformer for four bells and push-buttons, employing a common return wire. By cutting out and closing the original transformer low voltage taps, four



individual transformers may be introduced each between a push-button-to-bell wire, as per system "B," without the need for adding wires to the existing system. This can only be done, however, when the new transformers may be placed where it is convenient to cut into the bell wiring circuits, while also having the 110-volt connections available.

Aligning Floor Runs to Fit Exact Conduit Templates

An inexpensive support may be provided for conduits which are stubbed up from rough concrete floors so that they will fit exactly into the drillings which are being provided in subsequently-installed panelboard boxes. This method is helpful for rush jobs where the conduit must be installed before the boxes arrive on the job, or for spaces where the conduit must be installed in the floor fill, but where the boxes must not be placed upon the wall until after the plastering or tile

Show Customers how to avoid costly STOPPED Motors

Fuse Chart—FREE

A handy guide to selection of proper size fuses at a glance, for the adequate protection of motors. Ask for Fuse Chart No. 18.

The secret of Jefferson Super-Lag performance is in the lag plate on the Super-Lag link. This plate delays the normal fuse action, provides a time interval or lag by absorbing temporary heat rise. This time-lag prevents the fuse from blowing on harmless temporary overloads—saves needless STOPPED Time and link replacements.

The high cost of STOPPED motors is a sales opportunity for you. Show customers how they can eliminate needless stops which disrupt schedules, stop men, throw production out of step by using fuses which protect TIME along with the motors.

Jefferson Super-Lag Renewable Fuses do not stop motors needlessly. They do not blow the moment current rises—do not blow if the overload is only momentary. But they operate positively before the actual danger time is reached. It is this "wait" which eliminates needless STOPPED TIME—which protects TIME along with motors.

Sell protection against needless stops as well as against motor burnouts by pushing Jefferson Super-Lag Fuses. Made in all capacities, knife-blade and ferrule types.

JEFFERSON ELECTRIC COMPANY
Bellwood (Suburb of Chicago) Illinois
Canadian Factory: 535 College St., Toronto

JEFFERSON
Super-Lag RENEWABLE **FUSES**

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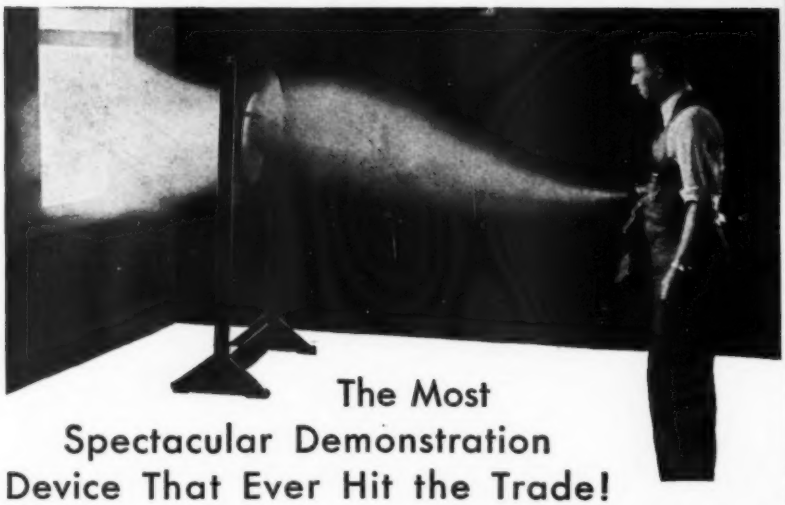
Where There's Smoke . . . . .
. . . . Where There's Bad Air
There's a Way to Clear It
AT A PROFIT TO YOU!



The Most Spectacular Demonstration Device That Ever Hit the Trade!

Get this sure-fire sales clincher. Put it to work to boost your Emerson Exhaust Fan profits to a new high! The way is wide open—the country is "conditioned air" minded—prospects all around you feel the need for perfect ventilation—and Emerson Exhaust Fan equipment, backed with 45 years of experience, is way out in front when it comes to quickly, quietly and economically clearing the air of smoke, fumes, steam and excessive heat. All you need to do is prove the magic-like air moving capacity of Emerson Exhaust Fans. Not with words, not just with printed sales literature, but with an actual, on-the-spot demonstration that clinches sales instantly.

Backed with Advertising

We're going to make millions of men and women even more conscious of the need for perfect ventilation—with a substantial advertising program. It will reach hundreds of people right in your territory. Naturally, all inquiries obtained will be turned over to Emerson retailers and wholesalers. Emerson will furnish sales-getting consumer folders (imprinted) to mail or give out. This campaign will mean added sales and profits to you.

Line Up with a Proved Recognized Line

There is no doubt about it. You'll be all set for the biggest profit year you have ever known when you line up with Emerson. You will be selling equipment of proved performance with six Emerson sales-getting features that represent the latest development in the field. The line is complete. There is a size for every need and all carry the Emerson one-year guarantee against mechanical and electrical defects.

We're offering a line that's a leader in this field—with attractive profits—with advertising cooperation—and a spectacular demonstrating and display unit—furnished FREE to retailers stocking Emerson Exhaust Fans.

Get all the convincing details at once. Write today for Folder 45Y.

The EMERSON ELECTRIC MFG. CO.

NEW YORK ST. LOUIS CHICAGO

FANS EMERSON MOTORS BUILT TO LAST

LEADERS IN THE FAN AND MOTOR INDUSTRY SINCE 1890

work is done. By employing such a rigid preliminary conduit support it is possible to predetermine factory box drillings and eliminate on-the-job knockout cutting labor.

The steel conduit supporting plate in the foreground of the accompanying illustration is 18 in. by 6 in., and is flanged down 1 in. The five 1½-in. home run conduits are spaced on 3½-in. centers. The panelboard box, which has been ordered with corresponding drillings, will be set in place upon these stubbed-up conduits after the wall has been plastered. This method is employed by J. Livingston and Co., New York, N. Y., on large commercial work.

Compact Control Wiring

In modernizing the wiring for forty-eight remote-controlled curtain raising and lowering units in the Metropolitan Opera House, New York City, the E-J Electrical Installation Company installed a con-

tinuous run of 1½-in. conduit and fittings for the entire battery in front of the machine frames. A "C" type fitting with 2-wire cover was installed in alignment with each brake-shoe solenoid, while a short conduit run was stubbed upward from a "T" type fitting for en-

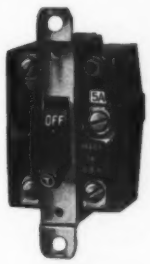
"PROTECT THOSE SMALL MOTORS *with the* NEW TRUMBULL 'T.T.' STARTERS"

Look into the **New Trumbull "T.T." Tumbler Starters with Thermostatic Overload Protection** and Interchangeable Heaters, single or double pole.

JUST A FEW OF THE MACHINES WHICH SHOULD HAVE "T.T." PROTECTION:

- Small Lathes
- Small Grinders
- Blowers
- Circular Saws
- Drill Presses
- Filing Machines
- Addressing Machines
- Small Printing Presses
- Washing Machines
- Floor Polishers
- Oil Burners
- Refrigerators
- Ironing Machines
- Sewing Machines
- Pumps
- Stationary Vacuum Cleaners

No. 1205
Surface Type Starter



No. 1205-S
Unit only

CIRCULAR No. 119

GIVING FULL DETAILS GLADLY SENT ON REQUEST.

WRITE TODAY

HORSE POWER RATINGS

	115 V.A.C.	230 V.A.C.	32 V.D.C.	125 V.D.C.	250 V.D.C
1 Pole	1	1	—	—	—
2 Pole	1	1	¼	½	¼

SALIENT POINTS

1. Absolute protection for small motors by thermostatic overload trip.
2. One heater unit to a starter.
3. Heater elements interchangeable; rated, .3 to 12 amps.
4. No fusible element to burn out.
5. Switch contacts, silver to silver.
6. Available in surface or flush types. Surface type in small galvanized box 2⅝" W. x 4" H. x 3" D.
7. Starter mechanism completely enclosed in bakelite case.
8. Starter unit only can be mounted in any standard deep wall box.

THE TRUMBULL ELECTRIC MFG. CO.

A GENERAL ELECTRIC ORGANIZATION

PLAINVILLE, CONN.

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Insist on se

UNDERWRITERS' LABORATORIES
INSPECTED
ELECTRUNITE
REG. U.S. PAT. OFF
RIGID
STEELTUBES-B
PAT. NOS. 1388434, 1435306, 1962876
N-57
ELECTRICAL METALLIC TUBING

seeing this label . . .

IF YOU WANT ALL THE ADVANTAGES OF *genuine*

ELECTRUNITE Steeltubes

REG. U. S. PATENT OFFICE

ELECTRICALLY • WELDED •

Go ahead! Design your own conduit. Make a list of all the desirable features that you would incorporate in it. Then examine a length of conduit that bears the label of Electrunite Steeltubes. There you will find every feature that you placed on your list—and probably more.

You'll find it light and easy to handle. You'll discover it easy to cut and bend. You wont have to waste time and effort in threading it. You wont have to carry a wide assortment of fittings—three simple couplings adapt it to any job. You'll find a new inside surface in most sizes that will reduce the effort required to pull cable by approximately 30%. You'll find that it affords ample electrical and mechanical protection to wiring in spite of its lighter weight, and that it has full approval for most purposes.

Contractors using this modern electrical metallic tubing are enthusiastic about it. They find that in addition to the foregoing advantages, it costs less with all couplings included than old-style conduit. It is a profit maker—and you can't afford to pass up a label that can mean so much to the future of your business. Write for a sample.

Patent No. 1,962,876

Knurled inside finish available in ½", ¾" and 1" sizes

Electrical Division

Steel and Tubes *Inc.*

WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING

CLEVELAND . . . OHIO

SUBSIDIARY OF

REPUBLIC STEEL CORPORATION

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Here's How

TO MAKE *DEPENDABLE* WIRE JOINTS!

1

Skin wires in the usual way

Screw *thread-on* Connector onto the wires by a simple turn of the fingers

2

THE FINISHED JOB

Took 15 seconds! Required no special tools — used no solder — no tape—no flux—no iron, etc.

That's all!

Thread-on **Connectors have a conical-shaped spiral-spring metal insert into which the wires to be joined are inserted. The Connector threads on like a nut, compressing the wires together with a vise-like grip giving a much tighter and therefore better electrical copper to copper contact than is possible with a solder and tape connection—which at best is simply a loosely twisted joining of the wires.**

The ¼" molded composition surrounding the insert is unaffected by heat, cold or moisture and there is no danger of wires piercing insulation as with solder and tape joints.

USE WIRE CONNECTORS of *thread-on* principle

They're faster, yet provide a greater degree of safety. Millions used every year for roughing-in work, fixture hanging—and appliances—and for numerous other applications where trustworthy wire joints are required.

Approved by Underwriters' and Factory Mutual Laboratories. Recommended by the National Electric Code. Covered by U. S. Patent No. 1,700,985.

The five manufacturers listed below, offer their advice on your wiring problems.

Wiremold Company
Hartford, Conn.

Ideal Commutator Dresser Co.
Sycamore, Ill.

Bryant Electric Co.
Bridgeport, Conn.

Weiss & Biheller Merchandise Corp., New York, N. Y.

General Electric Co.
Bridgeport, Conn.

closing the wires required in each horizontal drum control at the top of the eight curtain control machines. Although three motors were installed for operating the master sheave shafts, each equipped with an automatic controller, the wiring method for this entire battery made it appear as if there was only one common circuit. The rigidly mounted single run of conduit and fittings was kept down out of the way of mechanical repairs and adjustments, yet above the floor so as to permit regular floor sweeping. In case of unforeseen electrical trouble, the fittings are readily accessible for testing or replacing conductors.

Conduit Racks for Wall Clearance

A steel conduit rack which provided rigid side-wall support for a group of large feeder conduits and which permits routing these conduits so as to avoid bends or offsets for clearing existing obstructions was recently installed by the E. J. Electrical Installation Company, New York City. Vertical supports of 3-in.

by 1½-in. steel channels were bolted at the ceiling and at the floor by means of short angle iron shoes. Through-bolts below each conduit provided suitable conduit clamping and alignment pressure. In cases where the floor was slotted for shaftways, double back-to-back steel channel bridges or cross members were installed to span the floor openings for supporting the vertical conduit supports. The above design was used for two and three-layer banks of 2½-in. to 4-in. horizontal wall runs.

BULL DOG
SWITCH FUSE CENTERS

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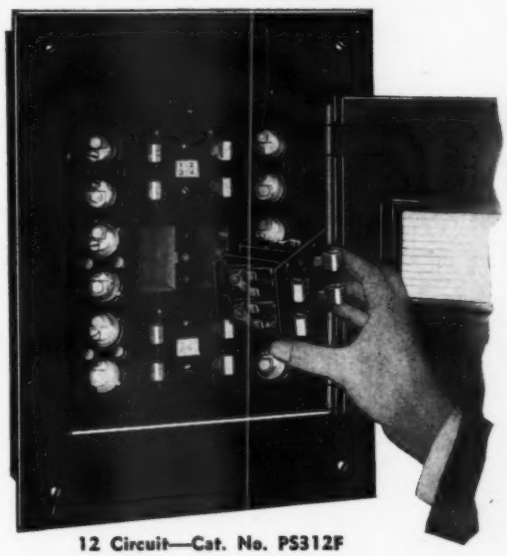

12 Circuit—Cat. No. PS312F

This cut illustrates how, by throwing Switches to the "OFF" position and removing two screws, the Toggle Switches can be lifted out of the assembly, for inspection or maintenance, without removing the Unit or the cabinet Trim.

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Code Chats . . . . .

Questions and answers relating to the interpretation of the National Electrical Code . . .

Conducted by F. N. M. Squires

Chief Inspector New York Board of Fire Underwriters

Common Conductor

Where a job has more than one circuit would it be permissible to use one grounded wire large enough to carry the entire load for all the circuits? In other words if I had four circuits, to use one white and four black wires?

Yes, this is permissible provided the common wire is of sufficient carrying capacity for the four circuits.

For instance, if each circuit has a load of 10 amp., the common wire, in this case, would have to be No. 6 to carry the 40 amp.

Also, if this is on an a.c. system and the wires are in armor or conduit, all four wires must be within the same armor.

Advantage of the 500 Sq.Ft. Rule

What advantage would there be under 2010-a in wiring a house on the basis of one 15-amp. branch circuit for each 500 sq.ft. of space? It would allow any number of outlets but it would cost more for the wiring and I cannot see the advantage. I should think the circuit would be more apt to be overloaded.

The purpose of the rule is to encourage the installation of a sufficient number of outlets for lighting purposes so that the use of flexible cord circuit extensions will become unnecessary. For with an excess number of outlets and receptacles it is considered that no part of the area would be very far from an outlet, thus eliminating the probability of cord extensions.

The circuits must still be fused at not over 15 amp. which on a 120-volt circuit allows at any time the use of 1800 watts. This would give an illumination of 3.6 watts per sq. ft. which, of course, is considered extremely high. Therefore, it is considered that the possibility of overload is remote.

It is, also, cheaper to install a number of outlets on one circuit than to put them on two, three, or more circuits. Therefore, the cost should not be more.

What Are the Service Wires?

Are the conductors spliced to wires where leaving service conduits and extended to meet wires from pole line to building considered a part of the service drop? If so, may change be made in the size of wire?

The two parts of the overhead service wires mentioned above are clearly defined in Article 1 of the Code.

The wires between the pole on the street and the point of attachment on the house with the service entrance conductors is the service drop and by rule 402-a shall not be smaller than No. 10.

The wires between the service equipment and the service drop are the service entrance conductors. These generally are the wires in the standpipe and under rule 404-b shall not be smaller than No. 8, except for installations consisting of a single branch circuit in which case they may be No. 12. In this latter case the service entrance conductors may be smaller than the service drop, but in some other cases the service entrance wires might be No. 8 and the service drop No. 10.

Besides the minimum sizes referred to above, the determining factor for the size wire is the expected load.

Pioneer in Safety Work: Beginning in 1887 in the police and fire alarm office, T. W. Bowry (right) has amassed a long record of public safety service in Richmond, Va. Since 1924 Mr. Bowry has served as chief electrical inspector. An important function of the department is to speed to all important fires to investigate for possible electrical origin, and this includes night alarms, all of which are transmitted to Mr. Bowry's home. G. M. Miller, (center background) is in charge of inspecting all appliances, devices and materials that are sold or displayed in the city of Richmond, while Grace Strong attends to the secretarial details of the office.

Number of Wires in an Outlet Box

Rule 512-q allows eight No. 14 wires in a 3¼-in. box that has no fixture stud. How many wires would be allowed if a fixture stud was used in the box?

I figured that a fixture stud would take up about .2684 cu.in. This is much less than the 2 cu.in. allowed for a No. 14 wire.

Inasmuch as the fixture stud takes up such a small amount of space there is no reason why such a stud should not be disregarded. However, where more room is occupied, account should be taken of it and proper allowance made.

Does rule 512-q apply to switch boxes?

Some switch boxes are used as outlet boxes and many are used as junction boxes and, therefore, should be subject to the same limitations.

Brass Shell Sockets Over Cement Floors

Is it permissible to use brass shell pull chain sockets when they are installed 8 ft. above a cement floor? (On ground floor in building.) If not, why?

Rule 1405-c requires that weatherproof sockets be used in damp or wet places.

Most inspection departments construe this to mean that where a

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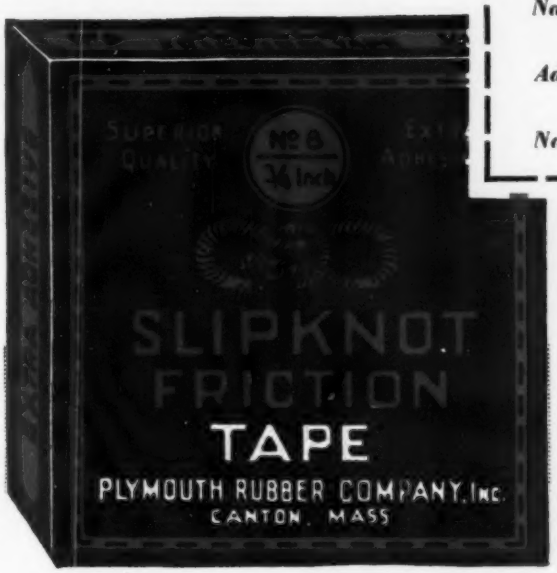

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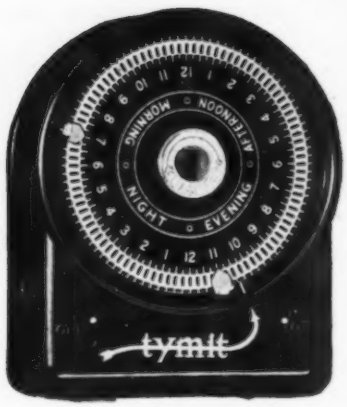

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are looking for me.
Even big storekeepers get swell
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Do you know how many people
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have electric refrigerators
without automatic defrosting,
which every new type has
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How would you like
to get a refrigerator
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and then be told it wasted food
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defrost it every day,
which nobody ever remembered yet?
Take me out to these people;
I'll educate their refrigerators
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If you have anything to do
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Please tell me how to sell Tymits, which I understand are high grade, electric clock driven switches and receptacles, combined in beautiful chrome and bakelite cases in black or walnut finish. I am particularly interested in:

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socket is installed above a cement floor in a basement or a cement floor which is considered damp, it shall be of the weatherproof type. They do not, however, consider all cement floors to be damp and do not generally require the weatherproof sockets over cement floors above the ground level unless such a floor is in a place where the nature of the business carried on necessitates the floor being damp.

Cement floors above ground level generally dry out sufficiently to not carry a ground.

Bakelite sockets should be just as satisfactory in damp locations as porcelain ones.

Must Range Wiring Be in Conduit?

Is there any rule in the Code that states that heating devices over 1,630 watts shall be run in conduit, under ordinary conditions? If possible, I would like to use armored cable. The question refers to range wiring.

There is no rule in the Code which requires that all range wiring be in conduit.

Rule 1603-a requires that such wires "be so located and/or installed as to be adequately protected from mechanical injury and moisture." This, of course, may be construed rather broadly but where the wires would not be subject to mechanical injury or moisture the use of conduit could not be insisted upon.

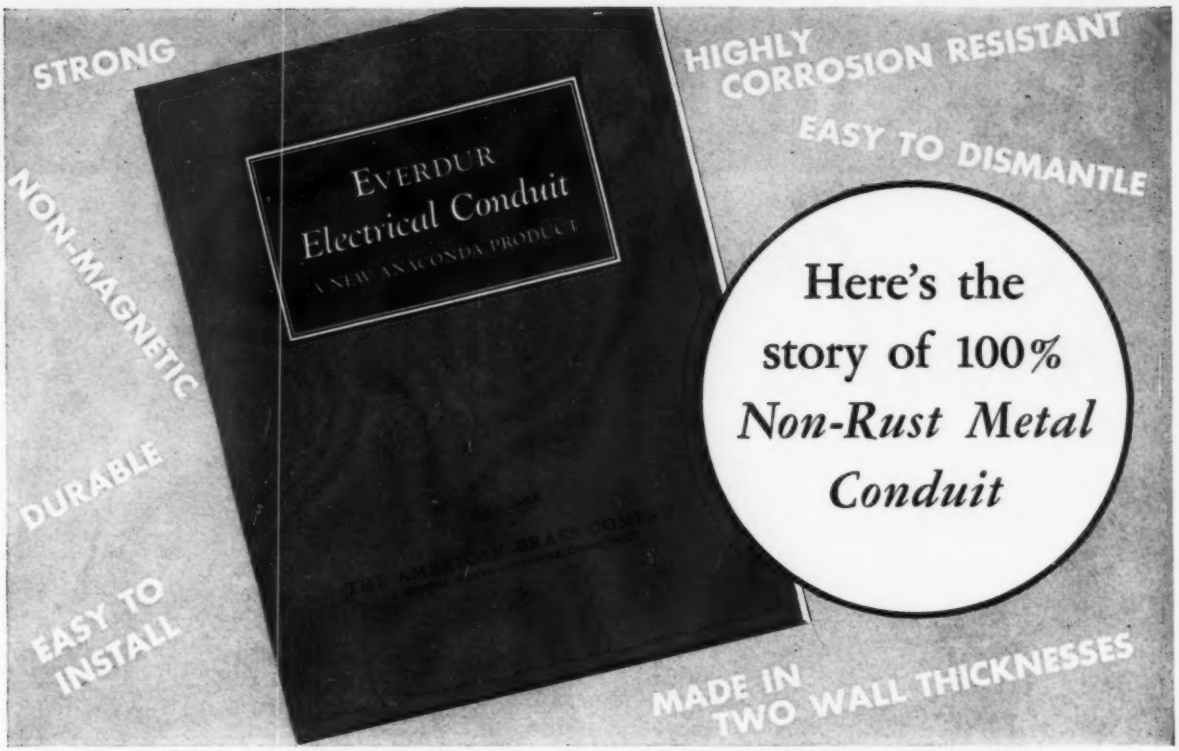
Use of High Voltages in Buildings

Does 5002 mean that any voltage under 7,500 is allowed inside of a building for wiring up to a motor, etc? I should think this would be dangerous. A few years ago anything over 600 volts would not be allowed in a building.

The Code, in 5002-a, prohibits circuits at more than 7500 volts between conductors to be installed within a building.

Circuits of between 600 and 7500 would then be governed by rule 2002-c and would have to be run in approved cable in rigid conduit or duct. If the cable is not lead sheathed it must be run in rigid conduit.

It is felt that proper automatic protection and enclosure in metal (lead sheath and/or rigid conduit) makes circuits of this votage range safe.



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To assist you to get these jobs and to make the correct layouts for the lighting installation, we have prepared "A Guide to Effective Lighting of Night Sports" and "A Manual of Lighting Layouts for Night Sports." With the superior features of Benjamin floodlights well recognized and with installation of these floodlights in every part of the country to point to, you will find it easier to secure acceptance of your suggestions from park boards, community recreational directors, school boards, school and college athletic directors and coaches, and others considering lighting for outdoor night sports. Copies of the Benjamin sales helps will be furnished to you on request.

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A 24-page bulletin outlining the most effective means of night lighting of sports fields.

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ELECTRICAL CONTRACTING

S. B. WILLIAMS, Editor

State Laws

There has been an unusual amount of agitation this year for state licensing of electrical contractors. Two of the bills have passed, some have been killed, and some are still in hearings.

Do the contractors think that state licensing will cure their difficulties? Do they think, for instance, that it will banish bootlegging?

These questions are prompted, because Massachusetts has had a state licensing law for years, yet the contractors in the Boston area have found it advisable to organize for the purpose of selling the public on having all wiring done by licensed contractors.

In other words, the Boston contractors have found out that no matter how good a state licensing law you have, and Massachusetts is proud of its act, you must not expect it to do the job alone. Unless the public is sold on the merits of the act, it is going to be easy for people to break it.

N. R. A. or Else?

Does business want an opportunity at self-regulation such as is offered under N.I.R.A., or does it want to go back to the old dog-eat-dog competition, yet strictly controlled in all of its dealings with labor?

N.R.A. has been criticized both for what it does and for what it does not do, and most of these criticisms have probably been justified. However, has no good come out of the Code?

Let the thousands of electrical contractors who are regularly paying their assessments to the Code Authority say whether or not the Code has done any good. Let them compare their present method of doing business with what it would do without a Code, and see whether the Code has been worth while. Let them forget the petty grievances and the times when compliance did not right matters. Nothing is ever perfect. Look fairly and squarely for the benefits and then ask yourselves whether they are worth the price.

And then when you have decided, let your representative at Washington know, your senator also, and the President.

The Commercial Inspector

The electrical inspector is taking a new place in the electrical industry. Instead of being merely a policeman enforcing the law, he now is becoming a constructive commercial factor. In North Carolina, as noted in this issue, the inspectors are promoting the industry standards of adequate wiring—and meeting with quite some success. Incidentally, they are the first to attempt to put these standards into commercial operation. In New York the inspectors are promoting public education on the subject of safe wiring. They are contacting the newspapers, building displays, etc. In Virginia an inspector is visiting the schools, teaching wiring safety. In one city in North Carolina, the inspector pushed reinspection with the result that all of the contractors are busy.

Numerous other examples could be given, each of which are legitimate efforts for inspectors, but each of which are also decidedly promotional. This is a tremendous force for the good of the electrical industry. Its value should be recognized more.

Because of his position the inspector cannot promote a certain device or system, but he can promote the business of the electrical industry. He is keen to see the business grow, because that makes his job all the more important. When business falls off as it has during the past few years, his job becomes much less secure.

Cheap Wiring Devices

The analysis of wiring device characteristics with respect to price class that appears in this issue, was made for the purpose of learning whether or not the very cheap switches and receptacles that were being sold in such large quantities were really inexpensive. Of course, the analysis shows quite clearly that any contractor who buys the very cheapest grade, thinking he is saving money, is just foolish. By the time he gets through spending the extra time needed to install the device he has eaten up in wasted labor the difference

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between the very cheapest and the better grades, let alone the probability of additional expense through the replacement of defective devices.

This whole subject, however, brings to light something that we all too frequently lose sight of, namely, that the improvements to be found in the more expensive devices are generally there for some good purpose. For instance, devices with plaster ears cost more than devices without them. What, however do plaster ears do for the contractor? This is only one of a large list of improvements, each one of which is based on some good reason.

Now, if the saving involved by buying the cheapest devices amounted to some worthwhile figure, there might be something to sell the customer. The difference, however, in the prices is not such as to make any very great difference in the price of a job. Moreover, the better devices, it would seem, offer the contractor something of a very definite sales value, when competing with cheap device contractors.

Any way you look at it, it seems that the electrical contractor is losing by using the very cheap wiring devices. They cost him more installed, and they hurt his relations with his customers.

30-Hour Week

There is before Congress a bill known as the Black-Connery Bill, which would make the work week for labor 30 hours. Organized labor is its strongest advocate. We suggest there are several economic aspects of the 30-hour week which electrical contractors would do well to consider.

In the first place, labor has no intention of exercising a reduction in working hours except at the same weekly pay envelope. At the offset, then, a reduction in hours from 40 to 30 means an increase in the hourly rate of 33⅓ per cent.

Every job has a certain amount of fixed time for starting in the morning, stopping for lunch and starting afterwards, and preparing to leave at night. To go from an eight to six-hour day, according to figures published in **Electrical Contracting** in January, 1934, means 5 per cent or more additional labor, or nearly 7 per cent extra cost to take care of fixed time alone.

In addition there are several other extra costs that are bound to come with a 30-hour week. In the first place, the number of men will have to be increased because the owners are seldom willing to prolong the construction time because of investment charges. More men mean more superintendence, more job confusion, more tools, more frequent moval of shack, tools, shanty, etc.; in fact, higher job overhead all around.

It seems safe to say that going from a 40 to a 30-hour week would increase electrical construction costs from 45 to 50 per cent and maybe more.

Because the same thing is true of the other mechanical trades on a building, and to a lesser degree perhaps of the other building trades, what will be the effect upon construction? Already the charge is laid against construction that it costs too much, particularly of labor. Can it stand a further increase of 40 to 50 per cent in labor?

Will this not merely act to hasten the production of less expensive forms of construction, such as the factory made house, raceways integral with building members? Does labor want that?

Also we want to ask whether or not there is enough labor to handle electrical construction work on a 30-hour basis, provided there is any substantial increase in amount of work.

It is true that electricians are not working a large percentage of the time, but it must be remembered that we do not have as many electricians as we had five years ago. Old age, death, illness, other employment have taken thousands out of the ranks. And in the meantime replacements are lower. Furthermore, the men who have been employed have for the most part been the better men. Have the thousands who have done almost no electrical work for years retained the skill they had?

Even now a rush of construction in almost any community will send the contractors hurrying out of town for labor. With a little bit more work and a 30-hour week, where will they find that labor? How much will they have to pay to get it?

It should be fairly obvious to all in the construction industry, at least, that the answer to unemployment is not shorter hours but more work. The construction industry has been one of high labor content. As the cost of labor increased the national economic trend has been to devise ways to reduce the labor content.

We have seen this happen in the electrical field where certain wiring methods have lost out in one community after another when labor got above a certain figure. And we can see it coming more and more as labor costs increase. Any change to a 30-hour week, in our opinion, would merely serve to hasten that trend, leaving labor less work than formerly.

We cannot see that the 30-hour week has anything to recommend it to the electrical construction industry.

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Code Authority News

Material for this Department is furnished by The Electrical Contractors' Code Authority headquarters staff . . .

L. E. Mayer, Chairman, 7 So. Dearborn St., Chicago, Ill.

L. W. Davis, Executive Officer, 420 Lexington Ave., New York, N. Y.

E. N. Peak, Vice-Chairman, Marshalltown, Iowa

J. G. Livingston, New York, N. Y.

D. B. Clayton, Birmingham, Ala.

A. J. Hixon, Boston, Mass.

W. W. Ingalls, Miami, Fla.

R. W. Hodge, Kansas City, Mo.

W. A. Ritt, Minneapolis, Minn.

Lloyd Flatland, San Francisco, Cal.

R. L. Jacobe, Houston, Texas

The National Electrical Contractors Association sponsors the Code of Fair Competition for the Electrical Contracting Industry

N.E.M.A. Not Entitled to Code Stay

The National Electrical Manufacturers Association has been notified by N.R.A. that electrical manufacturers are not entitled to a stay from the enforcement of the provisions of the Electrical Contracting Code on the ground that they were represented at pre-Code hearings.

N.E.M.A. recently notified the members of the electrical manufacturing industry that they could engage in electrical installation work without giving any consideration to the contractors' code. The Electrical Contractors Code Authority promptly asked for a hearing, whereupon N.R.A. discovered that N.E.M.A., having been heard prior to the signing of the Code, was not entitled to an automatic stay.

Miami Agreement Signed

The area agreement for Miami, Fla., has been signed by the President, and provides for a wage rate of $1.25 per hour for journeymen.

Must Have Representation of Independents for Agreements

Although nearly twenty area agreements have been drawn up and hearings held, only five agreements have so far been approved and signed. One of the principal causes of failure to receive approval is the apparent lack of representation of the local industry, both with respect to contractors and electricians.

The Code Authority has had occasion to point out more than once that it is not sufficient to show representation of the larger contractors, in spite of the fact that they employ a very large percentage of the local electricians. Unless the independent contractors and workers are shown to be adequately represented, NRA will insist that the local organizations secure satisfactory evidence in the way of signatures to the agreement by independent employers and workers.

Because an area agreement imposes the terms of the agreement upon all within the local industry, it has been the policy of the administration to make sure that these agreements are voluntary and representative.

Construction Industry Asks for NRA Continuation

The construction industry, through the Code Authority and the Construction League, authorized Stephen F. Voorbees, chairman, to present a statement before the Senate Finance Committee, asking for a continuation of NRA along lines acceptable to the construction industry.

"One of the major benefits," said Mr. Voorbees, "derived by employers in the construction industry is the stride made in the direction of integration and coordination. It is an accomplished fact that today the representatives of the industry are thinking and acting in terms of the industry as a whole. Employers, likewise, have been exerting efforts to bring about the fundamental quality necessary as conditions of fair competition.

"The Construction Code insures the right of the industry to work out problems of self-government and self-preservation, as well as permits unity and industry planning for greater efficiency to a larger service to the public."

Mail Order House Denies Code Jurisdiction

Sears-Roebuck & Company has entered the electrical contracting business in several places, but because this work is incidental to its main business, it denies jurisdiction of the Electrical Contractors Code.

The Code Authority placed the matter before N.R.A., which has ruled that anybody engaged in construction is bound by the construction code unless specifically exempted by an automatic stay or other exemption.

Mayer Visits Southern States

L. E. Mayer, president, N.E.C.A., and chairman of the Electrical Contractors Code Authority, has been making a tour of the South in the interests of the association, and also to discuss code administration with the local men. His itinerary included the Florida Electrical Contractors Convention at Orlando, April 15 and 16, and meetings at Richmond, Va., Miami, Jacksonville, Atlanta, Birmingham, Chattanooga, Nashville, and Evansville, Ind.

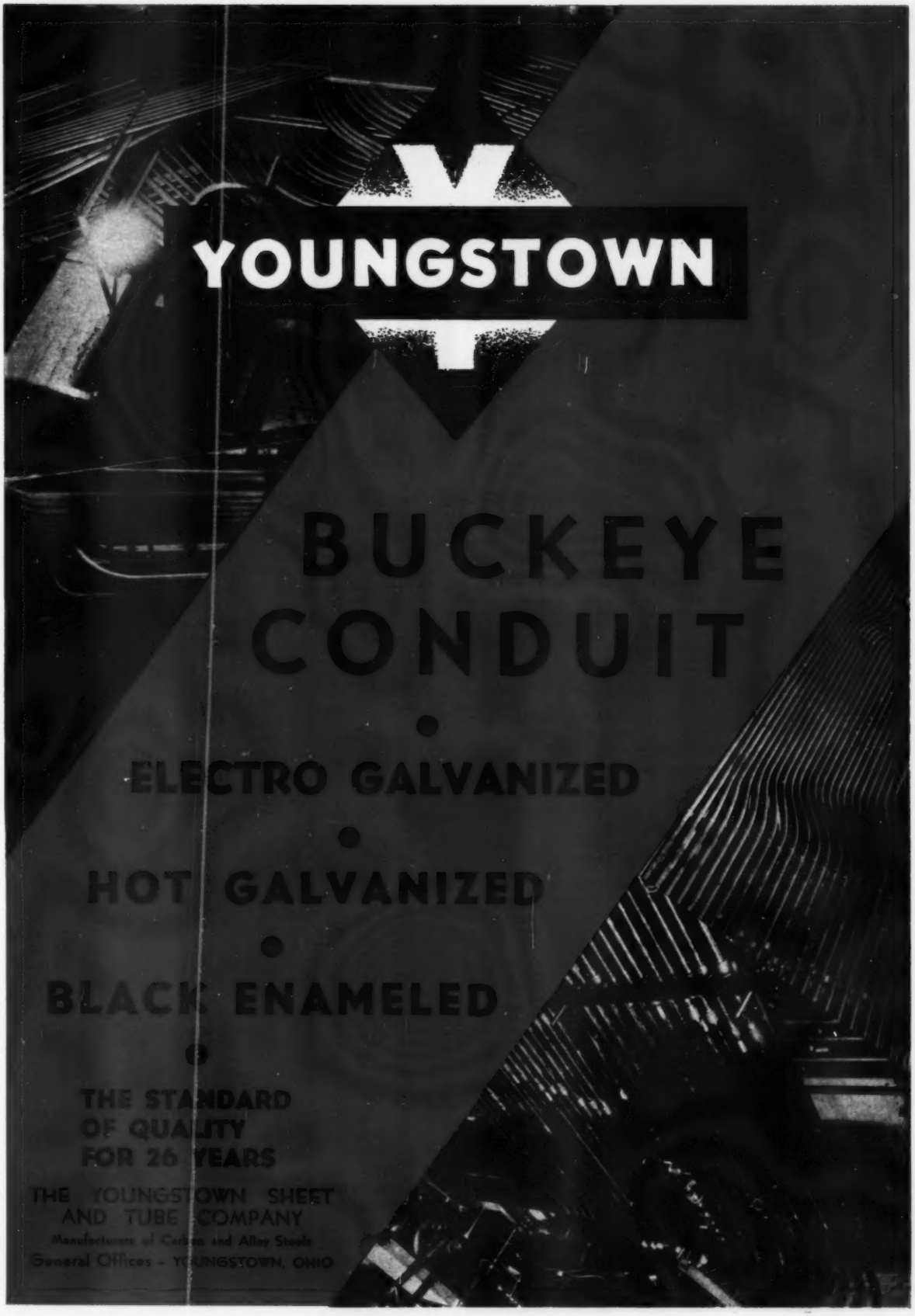
Stock Payments Constitute Rebates

The acceptance of stock in a construction project, as part of the payment is frowned upon by the Code Authority as a method of rebate or refund, and, therefore, a violation of Sections 6 and 7, Article IV, Chapter VI.

Status of Selling Below Cost Compliance

A great many complaints have been received by the Code Authority with regard to the difficulty in securing compliance on the selling before cost provisions of the Code. To cover this situation, the Code Authority makes the following statement:

"A cost finding and estimating method was formulated and submitted to NRA more than seven months ago but at that time a wave of complaints had reached NRA against so-called 'price fixing' provisions in many codes and an Administrative Order was issued which has withheld the approval of any provisions that might involve a tendency towards price fixing. In this group they have included up to the present time all cost finding methods that include provision for a minimum overhead below which no business can figure its selling price or which includes a minimum method of determining the cost of materials which the seller must use in pricing his services. We have made continuous efforts to obtain modification of this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BUSINESS STARTERS - these COLT-NOARK Magnetic Motor Starters

for Local and Remote Control

The terrific beating to which Motor Starters are subjected — day after day — demands a product in which quality of parts, ruggedness of manufacture, and perfection of design are built-in features. Colt-Noark Starters are simple in construction — and they have what it takes to stand up under the daily pounding of hundreds upon hundreds of operations. Models for either local or remote control — with Thermal protection for motors up to 25 H. P. Also Magnetic Contactors for automatically controlling power and light circuits up to 50 amperes. These units are built with safety and efficiency features that you would expect in a Colt product — and quality is apparent at every point. They are furnished in standard black enamel cabinets — or with weather proof or explosion proof housings.

Magnetic Contactor

Push Button Stations

Push Button Switches to complement the Colt-Noark line of Motor Starters and Contactors can be used in remote positions for controlling magnetic starters in all sizes up to 150 H. P. and operate efficiently on circuits of 32 to 550 volts.

Push Button Station

Resettable Station

Resettable Thermal Switches

Colt-Noark Motor Starter Switches with Thermal overload protection are available in the Manually Operated Type. They are designed to protect motors and equipment against damaging overloads. Automatic and positive in operation. Thermal heaters readily replaceable.

Combination Motor Starters and Safety Switch Units

These combination units are designed to conserve space — and to place in one convenient cabinet both the safety switch and the magnetic motor starter. The famous Quadbreak and Dualbreak Switching mechanisms are utilized in these units — with the ultra-efficient Noark Magnetic Motor Starters. Generous wiring space top and bottom — plenty of knockouts — and attractive, ruggedly built cabinets.

Combination Starter and Safety Switch

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Pacific Coast Representative
San Francisco, Los Angeles, Seattle

COLT-NOARK
SWITCHES - MOTOR STARTERS - FUSES

situation and the approval of some formula for cost finding satisfactory to NRA but up to the present time the matter is still unsettled and because of the attitude of Congress and the complaints filed with the Senate investigating committee it is doubtful whether any cost finding method will be approved until after the new act has been passed by Congress and definite knowledge is known of the future attitude of N.I.R.A. towards code regulations.

"Meanwhile, however, NRA have pointed out that although cases of complaints of code violation for selling below cost will be exceedingly difficult to prove and to have sustained by the Compliance Division, yet it is not impossible to submit such proof if it can be shown that the individual cost of the bidder is actually more than he has used as his individual cost.

"To do this it is necessary, of course, to show that the materials in the quantities or qualities specified for the project were quoted to the bidder at prices higher than he has used in his estimate and that he has figured his labor on a basis that would not permit him to pay the minimum wage established for electrical workers under the Code."

Loses Blue Eagle and Contract for Failure to File

The low bid for electrical work at the Marine Hospital, Chelsea, Mass., submitted by Creed-Hirons Company, Boston, has been rejected by the Treasury Department, and the contract awarded to the next highest bidder, and the company's Blue Eagle has been removed for failure to file copy of bid with the bid depository.

Dallas Area Agreement in Two Steps

The Dallas, Tex., area agreement hearing which was scheduled for May 1, proposes to reach its top wage in two steps. The first calls for $1.00 an hour for journeymen for the first six months; after that the wage shall be $1.12½ per hour.

Average Monthly Assessment $1.17

An analysis of the assessments paid by the members of the industry during the first eleven months of Code operation, showed an average per contractor of $12.91, or $1.17 per month. The total number of contractors paying assessments as of March 31, was 9,346. The Code Authority reports that this number is increasing materially each month.

Durable, long-lasting, "U.S." Holdtite Friction Tape is non-ravelling, has high tensile strength and great adhesiveness. Meets all physical requirements A.S.T.M. Specifications.

"U.S." Security is an outstanding grade of electrical and all-purpose tape. It is strong, has good adhesion. Will not ravel or dry out. Has no pin holes.

High in dielectric strength, "U.S." Relio is adhesive and easy to handle. When applied to the joint, provides a reliable waterproof covering.

Whatever your friction or rubber tape requirements, you will always find a "U.S." tape to fill the bill. For quick, neat, permanent jobs these tapes have won an ever-growing following among electrical contractors.

These tapes stick and *stay* stuck, are famous for durability and uniformly high tensile strength. Look for the "U.S." trademark when you buy tape; you'll be money ahead.

United States Rubber Company
1790 BROADWAY NEW YORK, N. Y.

Contracting .... News .....

Flood of State Licensing Bills

State licensing laws were introduced into nearly half of the state legislatures this year, the largest flood of such bills ever experienced. An analysis of these bills, only two of which (Oregon and Washington) have passed so far, made by the Uniform Legislation Department of N.E.M.A., shows the following:

11 States require licenses for masters, 10 for journeymen, 5 for contractors.

9 States provide board with power to make standards.

16 States provide for inspection by State.

6 States provide for inspection by cities, etc.

3 States provide for sales control.

Bill to Protect Sub-Contractors on Government Work

The N.E.C.A. has gone on record with the judiciary committee of the House of Representatives as approving the Miller Bill requiring contracts for public buildings or public works for the Government to be accompanied by a separate performance bond, protecting the Government, and an additional bond protecting the contractor and material supplies.

Under the present law, a sub-contractor must wait for six months after completion of entire structure, and final settlement between the United States and the principal contractor, before he can sue. The proposed law gives the sub-contractor the right to institute suit at any time through his separate bond.

Chicago Area Agreement Providing Work

Some excellent results are being secured from the Chicago area agreement, according to a recent report from the Complaint Investigation Board under the agreement. This board is informing contractors, owners and tenants of provisions of the agreement. Approximately fourteen hundred copies of the agreement have been sent out, covering all contractors and institutions engaged in electrical installation in the area.

The board has investigated approximately twenty-five complaints, and in almost all of the cases that have been followed up, the work in question has been turned over to contractors. Most of these jobs were started with employers who were not receiving the established wage scale nor complying with the hours of employment. It was found that the offending employer, rather than have one or two employees receiving twice what was paid to any other mechanic in the plant, would prefer to hand over the work to a contractor.

N.E.C.A. Sets Date For Convention

The first convention of the National Electrical Contractors Association in three years will be held at the Hotel La Salle, Chicago, Ill., on September 23-25.

Gets Back Door Customers — When V. L. (Vic) Thomas of the Thomas Electric Company, Des Moines, Ia., noticed the number of shoppers who parked in a lot at the rear of his store, his counters and shelves were rearranged to make it as convenient to enter from the alley as from the street. More good wiring and appliance orders are received from customers who come in through the alley entrance than from the street, Mr. Thomas claims.

To Promote Outdoor Meter Work by Contractors

The N.E.C.A. has launched its program to sell the services of the electrical contractor to the light and power companies for the installation of outdoor meter service and similar work which the contractor can do as well and more ecenomically than the utility. A letter outlining the benefits of such a program has been sent to all of the members and an initial conference has already been held by President L. E. Mayer, with a representative of the Edison Electric Institute on this subject.

Railway Signal Work Jurisdiction Dispute

At the request of the National Industrial Recovery Board, a hearing was held in Washington on April 18, before a committee of the board relative to the classification of installation work for railway safety appliances. The manufacturers of such appliances, two in number, have claimed that the electrical contractors Code had no jurisdiction over such work. The electrical contractors complained that they were unable to purchase certain safety equipment for installation on a subway contract. The manufacturers' contention was that only their own trained forces had the ability to make such installations, because of their intricacies.

The committee heard the case as a matter of jurisdiction of code authorities. A decision will be rendered later.

The contractors who were represented by the N.E.C.A. built their case upon the experience of a number of contractors who had made similar installations and were able to show that the work involved materials that electrical contractors are accustomed to install.

The case was presented by L. W. Davis, general manager of the Association. Testimony was given by Ed Ismond, Hatfield Electric Company, Cleveland; W. V. Pangborne, W. V. Pangborne Company, Philadelphia; and Arthur S. Henry, L. K. Comstock; Harry F. Fishback, Fishback & Moon; John L. Flagg, Watson-Flagg Engineering Corporation; Frank W. Cooper, J. G. Livingston & Company; J. L. Walters, Lord Electric Company; R. A. Goeller, Hatzel & Buehler, Inc.; Thomas Emerson, Emerson-Hines Company, all of New York.

Washington Passes State License Law

After fourteen years of effort, the electrical contractors of the State of Washington have finally succeeded in securing the passage of a state licensing law. The salient features of this new act which becomes effective Jan. 1, 1936, have been digested for ELECTRICAL CONTRACTING by S. G.

GEARED TO THE *Stars*

The Sangamo Astronomic Dial exemplifies the modern trend—the trend toward economical control of signs, billboards and window lights.

The Sangamo Astronomic Dial can be furnished on any Form VS or Type TC Sangamo Time-Switch. They are supplied with "on" and "off" arms which automatically change their daily setting to conform with the gradual change in rising and setting of the sun, or they can turn the circuit "off" during the midnight hours. Slots in the tripping arms permit a change in the time setting of forty-five minutes either way from the mean time setting.

Truly, the Sangamo Astronomic Dial is geared to the stars. It operates with the same unfailing accuracy—automatically.

Be sure you sell Sangamo Time-Switches equipped with Sangamo Astronomic Dials when "suntime" operation is advantageous. Ask your distributor to show them to you.

SANGAMO ASTRONOMIC DIAL

SANGAMO ELECTRIC COMPANY • SPRINGFIELD, ILLINOIS

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Plenty of Money to be made in schools

that need Sound Systems

RCA Victor Sound Reenforcement Installation in Girls' High School, New York City. Loudspeakers are concealed in the gondola suspended over the stage—four microphones are supported on standards along the edge of the platform, and an amplifier is recessed in the platform.

ALL schools need good sound systems. Keep in touch with the schools in your district—and make sure you get the job of installing their sound systems.

You'll find RCA Victor Sound Systems easiest to sell. Because RCA Victor has the world's richest experience—and the highest reputation—in sound.

Advertising is now going regularly to all school executives and school boards—acquainting them with the advantages of RCA Victor Sound Systems.

We gladly offer technical advice and detail drawings for all types of RCA Victor Sound Systems.

SOUND REENFORCEMENT SYSTEMS
PUBLIC ADDRESS SYSTEMS
CENTRALIZED RADIO SYSTEMS
SOUND PICTURE EQUIPMENT
PAGING AND ANNOUNCING SYSTEMS

RCA VICTOR
Commercial Sound Systems

RCA Manufacturing Co., Inc.
Camden, N. J.
A Radio Corporation of America Subsidiary

Hepler, vice-president, Electrical Club of Washington, as follows:

The bill contains three major features: One, the adoption of the National Electrical Code as a minimum standard for all electrical installation with several minor exceptions. Two, the providing for a $50.00 license fee for all electrical contractors. Three, the establishing within the Department of Labor and Industries of the State of Washington an enforcement department.

Among the several minor features is the flexible clause which provides that the Department of Labor and Industries shall procure and file in its office on January 1, of each succeeding year the latest approved National Electric Code rules. This provision automatically provides for the legalizing of the progressive code requirements. Provisions are made for cities to adopt higher or better standards if so desired. A bond in the amount of $1,000.00 is provided to insure compliance with the Code, also, as a guarantee for the payments of labor and material.

The funds required for the department are restricted to the amount accruing from the license fees. This condition will tend to lower the effectiveness of the department for possibly two years.

Washington has always been the dumping ground for sub-standard, unapproved and foreign made materials. The law does not directly prevent a repetition of the dumping. It does however prevent the use of such material by contractors. This provision will make the market less attractive for those who profit by undermining existing business channels through the introduction and sale of substandard or foreign goods.

From a contractor's point of view a standard has been established which will tend to stabilize all his efforts.

Permit Fees Based on Cost Proposed

A proposed amendment to the city charter of New Haven, Conn., would establish a system of fees for electrical permits on a sliding scale basis dependent upon the cost of the electrical work. A minimum permit fee of 50 cents would be charged for electrical installations or repairs costing from $10.00 to $25.00; $1.00 for jobs from $25.00 to $100.00; $2.00 for jobs from $100.00 to $500.00; $3.00 for jobs from $500.00 to $1,000; a fee rate of $3.00 per thousand for jobs from $1,000 to $20,000, and $2.00 per thousand for jobs of $20,000 and upward.

The foregoing proposal was to be reported to the city committee early in April, according to W. J. Mahan, chief electrical inspector of New Haven. At the present time the revenues of the inspection department consist only of the annual license fees, there being no permit fees charged.

LaVigne Reelected Florida Association Head

A very earnest two-day convention of the Florida Association of Electrical Contractors and Dealers was held at Orlando, on April 15 and 16. In addition to the business sessions, the meeting provided an opportunity for the state district chairmen and L.A.C. chairmen to discuss Code matters with L. E. Mayer, chairman of the Electrical Contractors Code Authority, and their regional chairman, W. W. Ingalls, of Miami.

George LaVigne of Miami, was reelected president for the next two years. J. J. Newell, of Orlando, was elected vice-president, and C. E. James, Fort Pierce, secretary-treasurer. The new executive committee elected are W. A. Brinson, St. Petersburg; J. H. Bennett, Winter Park; B. A. Ragsdale, Tallahassee; and Dan Newsom, Tampa. The hold over executive committee-men are Arthur Hamilton, West Palm Beach, and S. C. Reddick, Jacksonville.

Connecticut Contractors Sponsor State-Wide Licensing

It is estimated that about 250 electrical contractors attended a public hearing before the Connecticut general assembly on March 27, at Hartford, the state capital. This large attendance included representatives from all of the larger centers of the state. A decided majority expressed their approval of a bill before the assembly

Harry C. Abercrombie

which would require all contractors in the state to be licensed. Municipal licensing ordinances would be automatically repealed by the proposed bill, while the revenues received from state licensing would be remitted to the various communities pro rata after state administrative and examining expenses had been met. Earlier proposed legislation which incorporated sales control and workmen licensing was withdrawn for the more simplified bill in the hope that favorable action

NOW MAKE REAL *Money*...

Here's How to Make Money
Selling RELIEF FROM HEAT with
THE PRODUCT
THE MARKET
FREE DIRECT MAIL HELPS
NO DOWN PAYMENTS — 1 TO 3 YEARS TO PAY
MAIL THIS ORDER BLANK TODAY — NO CHARGE

SELL RELIEF FROM HEAT

With American Blower Products
Home Conditioners
Ventura Ventilating Fans
Sirocco Blowers and Exhausters

INEXPENSIVE AIR CONDITIONING

WE SHOW YOU HOW!

Sure You can Make Money
Selling RELIEF from BAD AIR
One of the three most important parts of
AIR CONDITIONING and one of the LEAST EXPENSIVE
THE PRODUCTS
THE MARKET
FREE DIRECT MAIL HELPS
STEP 1
STEP 2
NO DOWN PAYMENTS — 1 TO 3 YEARS TO PAY
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NEW FREE BUSINESS CARDS — A REAL SALES GETTER
STEP 4
MAIL THIS ORDER BLANK TODAY — NO CHARGE

Send for these FREE SALES PLANS

MAIL THIS COUPON TODAY

American Blower

AMERICAN BLOWER CORPORATION, 6000 Russell Street, Detroit, Mich.
Please send free copy of your Sales Plans to:

Name _____ Firm Name _____

Address _____

City _____ State _____ (1326)

NOW READY!

1935
"VERIFIED" DIRECTORY
OF
ELECTRICAL WHOLESALERS

Contains the following information
on 1,088 wholesaling establishments

1. Firm name
2. Address
3. Branch and affiliated houses
4. Memberships in National and Local Associations of Electrical Wholesalers
5. Names of officers and department managers
6. Territory covered
7. Number of salesmen—city, country and counter
8. Floor space occupied
9. Size of inventory
10. Lines handled (supplies, appliances radio, lighting fixtures)

PREVIOUS EDITIONS NOW OBSOLETE

This new Directory contains 123 new listings, 32 deletions and 825 revisions

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PRICE $15

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Substantially bound in handsome leatherette cover
Liberal Discounts
on orders for two or more copies

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Order from

The Electrical Trade Publishing Co.
330 West 42d St. New York City

might be secured during the present general assembly.

The united front that supported the spokesmen for this bill at the capital was largely accredited to the efforts of Harry C. Abercrombie, president of the Connetcicut Electrical Contractors' Association. Mr. Abercrombie is also president of the Bridgeport contractor group, chairman of the L.A.C., and chairman of the licensing and examining board of the City of Bridgeport, Conn.

New Officers Elected

Buffalo (N. Y.) Niagara Frontier Electrical Contractors' Association—Joseph Kamming, president; George Reinagle, vice-president; Peter Quermback, secretary; Frank Schumm, treasurer; Otto Wangler, Samuel Galvin and Al Wolf, directors.

State Licensing Proposed in Wisconsin

A bill to license electrical contractors, journeymen and inspectors has been introduced into the Wisconsin Legislature under the sponsorship of the new Wisconsin Electrical Association, with the backing of organized labor and other branches of the electrical industry.

The licenses are to be issued by the Wisconsin Industrial Commission upon examination, except where one has been actively working at this classification for at least three years prior to the passage of the act, in which case the examination may be waved.

The proposed bill requires inspectors

Adds Motor Repair Shop—Having specialized in heavy industrial and commercial construction work since starting in business in 1922, the Karrasch-Donly Electric Company, Inc., St. Joseph, Mo., now includes a motor and apparatus repair department. This department permits a closer and more complete service relation with various customers, and is doing nicely according to firm members O. A. Karrasch (right) and J. C. Donly. One of St. Joseph's outstanding industries, a large brewery, had this company completely rewire its plant over a period of two years at a cost of about $150,000.

YOU CAN'T GET EXCITED ABOUT KNOCKOUTS?

YOU say you can't become intensely enthusiastic about the fact that the C-H Safety Switch line has more knockouts, in a greater size range, and more conveniently located, and that they are rigidly inspected to see that they come out clean and easy?

Well, maybe that's natural. Maybe knockouts, by themselves, are a small detail. But, taken by itself, everything else on a switch is just a detail. The point is, C-H knockouts are *perfect*—and they are just one of dozens of other *perfect* details that go to make the *perfect* safety switch.

Compare the C-H line from any angle. Look at that dull-sheen finish; it will not scar and chip easily. Notice the way the corners join, the way the hinges work. Observe the clean die job on the switch hooks, note the strength of the riveting job; that blade and hook won't part under any treatment. Note that Types "A" and "C" Switches carry H. P. rating.

Take Safety Switches apart, *compare them point for point.* Then there can be no question as to which line will satisfy . . . Cutler-Hammer Safety Switches are featured by alert contractors and independent electrical wholesalers everywhere. CUTLER-HAMMER, Inc., *Pioneer Manufacturers of Electric Control Apparatus,* 1306 St. Paul Avenue, Milwaukee, Wisconsin.

The C-H line includes all types and sizes of Standard, Weatherproof and Explosion-Proof Safety Switches, and Meter and Range Switches for every locality—all built to the famous C-H Control Leadership standards.

CUTLER-HAMMER C-H SAFETY SWITCHES

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Junction box with lid.

Universal Joint.

Wire enclosing arm.

Triple beam projector

Now is the Time to Sell

QUAD

Floodlighting for Kitten Ball and other Outdoor Night Sports

Features of Type J Wire Enclosing Bracket:

Weatherproof wire way
Junction box and lid
Universal joint
40 deg. vertical adjustment
180 deg. horizontal swing
Cast virgin aluminum bracket

A porcelain enameled floodlight with two new and outstanding features that mean more business for you. (1) The chromium plated projector delivers a longer, broader beam—without streaks or striations and (2) the aluminum wire-enclosing bracket puts the light just where you want it—with only one bolt to tighten.

The new Type J Bracket has a 40 deg. vertical adjustment, 20 deg. up and 20 deg. down, and in addition, for the first time, a horizontal swing of 180 deg. without moving the bracket. It fully encloses the wire—look at the additional features which make it the Floodlighting unit desired by hundreds of contractors.

The Quad Line

Large range of reflectors for Industrial, Sign and specialized Commercial lighting, Floodlighting and accessories.

QUADRANGLE MANUFACTURING CO.

30 SOUTH PEORIA ST. CHICAGO, ILL.

WESTINGHOUSE SIGNALING TRANSFORMERS

for A-C.

Bells • Gongs • Horns • Sirens • Time Clocks • Annunciators • Signaling Systems

Now, you can install *Westinghouse* Transformers and "ring the bell" in more ways than one with your customers.

Made by the world's pioneer of alternating-current application . . and leader in transformer development since 1886 . . . Westinghouse transformers assure dependable, economical, trouble-free service. You can install them and forget them.

Get complete information from your nearby Westinghouse jobber . . . or write us direct.

Westinghouse Electric, Room 2-N, East Pittsburgh, Pa.

CHECK THESE POINTS

RATINGS—50 to 1000 watts. Tap voltages range from 24 down to 4, in steps of four volts.

PORCELAIN BUSHING—Can be removed where conduit is used. Fitting threaded for ½" conduit.

BLACK CRINKLE FINISH—Durable and attractive.

MOISTURE-PROOF—All windings and laminations are impregnated and case is filled with high-grade moisture-resisting compound.

UNDERWRITERS' APPROVAL—Listed by the Underwriters' Laboratories.

Westinghouse

B-52616-A

to be licensed unless they hold a journeyman's license. No license fees are required of inspectors, but while they are employed as inspectors they may not engage in wiring installation or even be interested in a concern so engaged.

The proposed license fees for contractors are $20.00 for examination, and $10.00 annual renewal; for journeymen, $4.00 for examination, and $2.00 a year renewal.

Employees of telephone, telegraph or power companies are exempt from licensing, except when they do work on customers' premises that is other than that usually required for furnishing or connecting service, or attending to utilities' property.

Any muncipality may also license those doing electrical work within its jurisdiction, but the fees are not to be in excess of $1.00 annually.

Boston Contractors Organize to Fight Bootlegging

The Master Electricians Association of Boston has been organized with a membership of nearly sixty for the purpose of selling the public on the dangers of bootleg wiring. Massachusetts has a state license law and it is the intention of this new organization to urge the public to engage only licensed people.

J. J. Reddington of Dorchester is president, Henry Miller, Roxbury, vice-president, and George W. McShane, South Boston, secretary-treasurer.

Norfolk Reinspection Brings City-Wide Wiring Activity

Recent reports from Norfolk, Va., indicate that gratifying results are being accomplished through a reinspection program which commenced Feb. 1, 1935. Several leading contractors are keeping special crews steadily engaged in rewiring and repairing defective conditions. The jobs are reported to range from $5.00 up to $250.00, the larger number ranging around $15.00 to $25.00 each.

This program is being conducted through the field efforts of an insurance rating bureau in conjunction with the division of electrical affairs, the city authority of Norfolk. A printed defect notice form was developed for this program which classifies 81 typical or likely hazards to be found during reinspection. This form must be signed by the electrical contractor after the violations have been corrected.

Only licensed electrical contractors may correct the defects that are found and listed by the inspector. A form letter, clearly advising the occupant or owner of inspected property to this effect, accompanies each defect notice. This method of procedure assures the correction of violations by qualified persons, and also causes a permit record to become built up in the city office. Some owners are reported to have had additional work done while the defects were being corrected.

In your F. H. A. wiring jobs

these convenient features mean CONSUMER INTEREST

FOR the RADIO:— No. 2145 Radio Outlet, providing aerial, ground and power connections with all wiring concealed. For the ELECTRIC CLOCK:— No. 7707 Clock Hanger Outlet, which provides mechanical support for the clock and includes electrical connection. For the ELECTRIC FAN:— No. 7750 Fan Hanger Outlet which holds the fan and combines the electrical connection. For the ELECTRIC RANGE:— No. 7950 Range Outlet which provides for straight-in wiring, with solderless connections. Interchangeable cable clamp allows for bottom or back wiring. For OUTDOOR APPLIANCES or lighting conveniences:— No. 7792 Outdoor Receptacle, weatherproofed throughout. These devices are the hub of consumer interest and the *center of sales-emphasis* in the successful merchandising of wiring jobs. *ALL* listed in your H & H Catalog and completely described in illustrated data-sheets, on request.

HART & HEGEMAN DIVISION
THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD. CONN.

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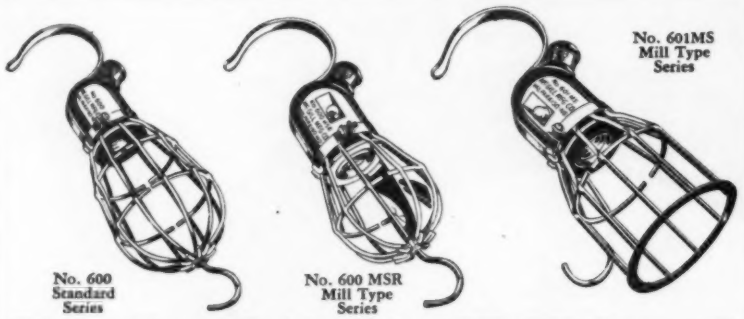

You Can Sell this NEW Guard

. . . the McGill Hook-Handle Portable

NEW WIDE HOOK

Demonstrate this new feature and increase your portable guard sales. Ask for literature

The portable guard has been modernized and its usefulness **doubled** by the invention of the McGill Hook-Handle Portable. Portable guard users will change to this new guard when you demonstrate how the hook-handle feature permits hanging or wedging the guard almost anywhere to give good light on hard-to-get-at jobs.

Heavy Electric-welded Cage Outlasts Cheaper Guards

Made of Bessemer Steel, electrically welded and cadmium finished, this guard will stand the gaff of the hardest service.

McGILL MANUFACTURING CO.

Electrical Specialties of Quality

ESTABLISHED 1904

VALPARAISO · INDIANA

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Specialists in **LIGHTING**

that differs from the conventional

UNUSUAL or difficult lighting jobs are everyday problems for Kliegl engineers—and they're ready and willing to assist you whenever you are in need of their services. Experienced in the design of special illuminants, and thoroughly familiar with lighting requirements, their aid assures satisfactory and desired results, with the utmost economy. We provide specially-built and standard equipment for all lighting specifications.

Ask for our cost estimates on your next lighting job.

KLIEGL BROS

UNIVERSAL ELECTRIC STAGE LIGHTING CO., INC.

Theatrical Decorative Spectacular Lighting

321 West 50th Street · New York, N.Y.

ILLUSTRATED CATALOG *giving complete information on all Kliegl Lighting Specialties supplied on request*

A Roll o' Tape

Electrical Flashes gathered among the big wire and pipe men

by

Electrical Contracting's Field Editors

BUILDING up the job — a residence wiring job near Norfolk, Va., has grown from an original $2,000 contract to $7,228, and the Old Dominion Electric Co. of that city hasn't run out of suggestions as yet.

A STIFF refusal to quote on a competitive 20-outlet new residence job resulted in the owner's father helping B. F. Best, Roanoke Electric Co., Durham, N. C., sell a 40-outlet job to the "shoppy" son without competitive entanglements.

MANY BIG wiring and motor repair jobs have been done by "Roland of Baltimore," a firm name which was chosen years ago by J. R. (Roland) Stolzenbach for the Roland Electrical Co., an outstanding Maryland organization. "Stolz" is chairman of the N. E. C. A., National Motor Section.

THIRTY-SEVEN years in business at one location is the record of Baldwin-Stewart Electric Co., Hartford, Conn. However, times and conditions do change, says E. M. Baldwin, and a recently completed move to more efficient quarters finally resulted.

ROADSIDE advertising of electrical service is a rare spectacle. Speeding along a North Carolina highway out of Winston-Salem one passes a 30-ft. electrically lighted sign board telling the countryside about the services to be had at the Clinard Electric Co.

TOM BENNETT, estimator for Alta Electric and Mechanical Co., San Francisco, claims the record for being on top of things. In 1915 he installed the lights of the then highest building in San Francisco, the Tower of Jewels

PANTHER *and* DRAGON TAPES

Panther Rubber Tape. Nos. 8, 4, 2 and 1 in individual boxes.

Panther and Dragon Friction and Rubber Tapes are outstanding among commercial tapes because they are backed by the reputation and experience of the Okonite Company, for over half a century a leader in the insulation field. This accounts for such features as longer life, greater tensile strength and adhesiveness, distinctive green cores, and for the Cellophane wrapping sealed around each roll.

Dragon Friction Tape. Nos. 8, 4, in individual boxes.

Handy Package. Contains 10 rolls of Panther No. 8.

Panther Counter Display. Contains 32 rolls of Panther No. 1.

Panther Display Rack. Contains 10 pounds of Nos. 8, 4, 2 and 1 Panther Tape.

HAZARD INSULATED WIRE WORKS

Division of

THE OKONITE COMPANY

Factories: Wilkes-Barre, Pa. Passaic, N. J.

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REPAIR SERVICE SHOWS "NEW TYPE" PROFIT FOR APPLIANCE DEALER

Proves Key to Live Prospects

The most profitable way to discover out-of-date appliances or the need of additional ones lies in carefully checking repair department records. Service men can profitably align themselves with appliance dealers for just this purpose.

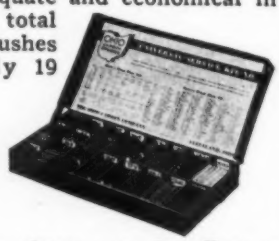
Keep In Contact with 20 Million Appliance Users

About 85% of the almost twenty million washers and cleaners which current statistics indicate to be in use are in the repair stage. While the saturation point is by no means reached, the best market for new appliance sales lies in replacing obsolete equipment or supplying the additional needs of an already demonstrated purchasing power.

Repair Service Cuts High Cost Of Cold Canvassing

Because of wear and oil soaking, motor brushes are the most frequently replaced appliance part. In fact, with a well rounded brush stock and a few other common parts, a repair man is prepared to not only solicit appliance repair work but also to sell worthwhile leads to appliance dealers.

A well rounded brush stock is offered in Ohio's new *Universal Service Kit No. 3* containing brushes, springs and oil wicks to fit over 131 makes of appliances. It is both adequate and economical in having a total of 150 brushes yet only 19 sizes.



Priced at $7.50 net, it offers a means of servicing practically any appliance regardless of make or age thus providing the necessary equipment to locate live prospects on a profitable basis.

ORDER FROM YOUR JOBBER OR MAIL COUPON

The Ohio Carbon Co., E. C.-1
12508 Berea Road,
Cleveland, Ohio.
Gentlemen:

Please send further details about your Universal Service Kit No. 3 including list of 131 nationally known makes that can be fitted.

Name _____

Address _____

City _____ State _____

at the Panama-Pacific International Exposition. In 1935 he has just recently completed installation of lights on top the flag pole of the Telephone Building for the Weather Bureau which is the highest building elevation in the city. This year he expects to install the lights on the very top of Golden Gate Bridge, the towers of which top those of any other structure in the region.

AN exceptional "Old house" job—105 years old and occupied, wired recently by the Carter Electric Co., Raleigh, N. C. Who has a better "old-vintage" example? (Historical buildings barred.)

SOME may gloomily say the country is going to the dogs, but it's a pleasant subject for A. Norden, Norden Electric Co., Portchester (N. Y.). The owner of a large nearby estate recently went in for dogs in a big way, resulting in a $2,000 wiring job for the lighting of kennels, yards, and keeper's cottage. Hot Dawg!

DEPRESSION buying methods are on the upturn in the opinion of Arthur Gaskell, Hartford, Conn. Old customers are again coming to the store for quality fixtures and merchandise, and some decent wiring jobs are being ordered. Some orders are to replace shoddy handy-man jobs that have caused the owners more or less trouble, and have proven to be false economy.

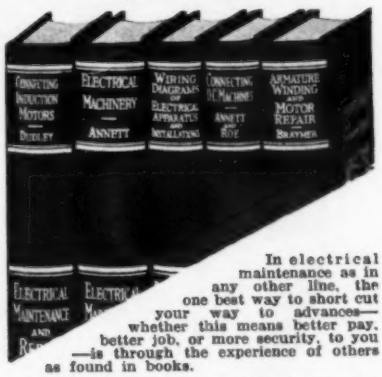
A BIG job on stilts—3000 h.p. in motors will be installed this summer for a coal pier at Norfolk, Va., by Morris Hunter, industrial wiring specialist of Richmond. The pilings are going down now.

CUSTOMERS are not kept waiting long when they phone anyone at the Central Armature Works, Inc., Washington, D. C. A code call system extends out over the three shop floors, and the telephones on these floors are within regulation booths, so as to cut down shop noise.

GAS service stations are about the most widely misunderstood jobs, according to H. L. Carter, Carter Electric Co., Raleigh, N. C. These desirable jobs are almost invariably underestimated, so that the labor cost is exceeded by reason of the numerous special trips required during roughing-in, and the final cost of assembling the yard lighting equipment.

RANGE wiring costs can be kept down so that there is more profit per job, says R. J. (Bob) Hennessey, South Norwalk, Conn. Where armored service entrance cable is used, the en-

Profit *by the experience of others* in practical wiring and repair methods


Connecting Induction Motors — Dudley
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—to install all types of motor and generator units

—to locate breaks in armature windings and do a workmanlike job of rewinding

—to know just what is wrong with an electrical machine and take charge of installation and maintenance work

—to make accurate tests of switchboards and apparatus and correctly balance the power with the load

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—to show competence, whether it be in the use of a Stillson wrench or a Wheatstone bridge.

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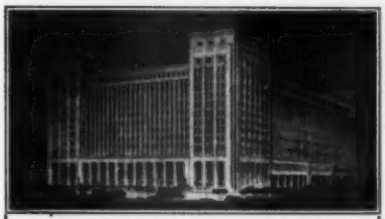

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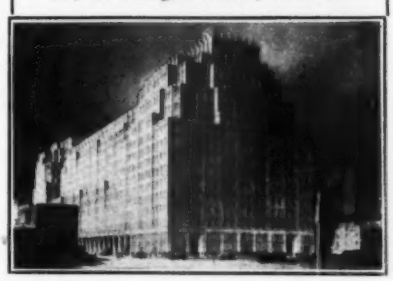

trance fitting can be attached in the shop, likewise some of the service and distribution equipment may be connected up before it is sent out to the job. This keeps the average time for ranges down to from 2½ hours to 4 hours for a journeyman and helper crew.

RADIO broadcasting twice a week has brought in motor repair jobs for Old Dominion Electric Co., Norfolk, Va., from remote points and neighboring states.

LAWMAKERS from among the ranks of electrical contractors are few, therefore J. C. Hobbs, Electrical Maintenance Co., Wilmington, N. C., deserves honorable mention as a member of the North Carolina State Legislature. Mr. Hobbs recently introduced a state contractor licensing bill that is reported to be progressing favorably toward enactment.

JIGSAWS and plywood have added a busy department to the Capital City Electric Co., Des Moines, Ia. Modernistic multi-color indoor lighting units are designed and made by this company for theatres in several states. The use of plywood for fixture framework reduces weight and permits special designs to be made up without the expense and delay of preparing patterns for castings.

REWIRING a 5-year-old power and lighting system in a Washington D. C., institution for efficient distribution and adequate voltage, required a $16,000 job to be done by Biggs and Kirchner, Inc., of that city. Just another example of the costliness of bid shopping on the original work.

"GO WEST, young man," said Greeley, but the Richall Electric Shop of Meriden, Conn., which is operated successfully by a father and son combination who hail from Minnesota, refutes this theory. Furthermore, this small industrial community benefits from father Richall's practical wiring knowledge, while the store is kept up-to-date with merchandise to suit the younger generation.

THE REMOVAL of cord wiring hazards in "swanky" Scarsdale, N. Y., residences means added outlet revenue to A. Seibert of the Scarsdale Electric Shop. Therefore one of the prominent items in this firm's well-arranged window display is a neat frame containing a poster which is distributed free of charge by the Electrical Cord Manufacturers. This poster illustrates eight outstanding abuses of portable cords. How many contractors have properly capitalized on the value of this inexpensive method of business building?

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For use in wood floors, mantels, baseboards, show windows, and other installations free from moisture or mechanical injury. Specially designed to furnish a neat, compact general purpose outlet.

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ADJUSTABLE
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Trade Notes . .

Connector Manufacturers in Cooperative Campaign

The five manufacturers of threaded wire connectors, Bryant Electric Co., General Electric Co., Ideal Commutator Dresser Co., Weiss & Biheller Merchandise Corp., and Wiremold Co., have started a cooperative marketing campaign to further the use of connectors.

This activity had been projected for some time, but until certain patent matters had been definitely settled, it was held in abeyance.

Time studies have been made and engineering data prepared, which will be made available upon request.

G.E. Launches Prize Home Building Program

A housing program designed to produce one new house for each 100,000 of population throughout the country by September 1, has been launched by the General Electric Company. The general plan is to offer selected builders new ideas, prize-winning drawings, substantial discounts and terms on electrical equipment, and national advertising and support, all in consideration of the construction by these builders of demonstration style houses. The houses are to be opened this fall to the public during the months of September and October.

The program is an outgrowth of the recent General Electric architectural competition, in which more than 9,000 architects submitted some 2,000 sets of drawings, from which 52 prize winners were selected.

Appleton Electric Co., Chicago, Ill., announces the removal of its New York offices from 150 Varick Street, to the Port Authority building, 76 Ninth Avenue, New York, N. Y.

Steel and Tubes, Inc., Cleveland, O., announces the appointment of J. D. Benfield, former New York district sales manager as assistant sales manager at the Cleveland general office. H. R. Turrell, formerly in charge of the Detroit, Mich., office has been made district sales manager at Philadelphia, Pa. J. S. Anderson succeeds Mr. Turrell at Detroit.

LEGAL NOTICE

PUBLISHER'S STATEMENT OF CIRCULATION

This is to certify that the average circulation per issue of Electrical Contracting for the six months' period July 1st to and including December 31st, 1934, was 10,283.

(Signed) Glenn W. Sutton, Manager.

Subscribed to and sworn before me on this 21st day of February, 1935.

(Notary Seal) LILLIAN E. BOWEN, Notary Public.

Bronx County Certificate 187. Certificate filed in New York County 1120. Register's office 6-B-685. (My Commission expires March 30, 1936.)

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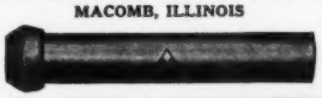
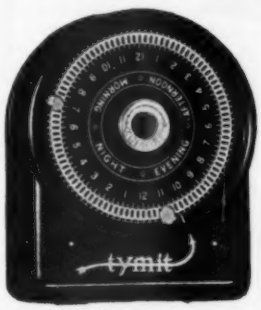


New Products . for May . . . . .

Time Switch

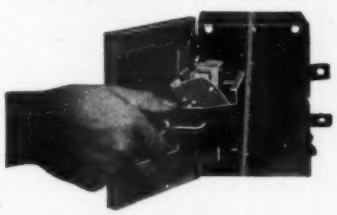
The Tork Clock Co., Inc., Mount Vernon, N. Y., announces TYMIT, a portable plug-in type time switch for general domestic uses in the control of radios, refrigerators, protective lighting, portable heaters, fans, window signs and spotlights. It is also available for wall mounting as a permanent control of oil



burners, furnace controls, store window lights, poultry house lighting, etc. The portable TYMIT has a rated capacity of 660 watts, while the installed unit is rated at 1,500 watts. It is finished in bakelite and chromium, and is available in either black or walnut cases. A standard 24-hour dial, adjustable operating arms, and complete freedom of manual control are features of design.

Swing-out Switch . . . . . .

A line of 30 amp. externally operable switches equipped with a swing-out interior is announced by the Square D Company, Switch and Panel Division, Detroit, Mich. The base and operating mechanism is mounted on a metal supporting plate which is hinged to the side of the box. By pulling on the operating handle, the entire interior swings out and away from the box, leaving the box area open for unobstructed wiring and conduit connections. With the wire and conduit in place, the interior may be swung back into place and the connections made. The hinged interior is self aligning.



The handle slipping into the slot at the side of the switch automatically brings the interior into place and retains it there. The interior may then be secured by a single set screw. The hinged support is elevated from the back of the box to provide ample space for laying wires behind the base without pinching the wires. This new line is available in non-fusible and plug and cartridge fusible, straight 2-pole, 2-wire solid neutral and 3-wire solid neutral switches, 125-250 volts and 250-volts, in 30-amp. sizes.

Portable Transformers . . . .

A line of portable instrument transformers for laboratory or commercial testing work has been announced by Weston Electrical Instrument Corp., Newark, N. J., which features models 327 and 328 current transformers. This line is claimed to represent a marked advance in transformer performance, due to ratio and phase angle errors being greatly reduced. Each model incorporates a large number of ranges which is claimed to frequently enable the replacement of several transformers of older types. Model 327 offers standard ratios of 10/20/50/100 to 5 amp. on bind-

ing post connected taps, and 200/300/400/600/1200 to 5 amp. with an inserted primary, while model 328 provides ratios between 1200 to and 2500 to 5 with a single primary turn through binding post connected taps. Ratios obtainable without exceeding 12 primary turns are graduated in 24 steps from 2500 to and 100 to 5 amp. These transformers are provided with Hipernik cores. The maximum secondary burden rating is 25 volt-amp.; frequency 25 to 133 cycles; test 10,000 volts for one minute. Model 327 is 9⅞ in. by 7¾ in. by 3 in., and weighs 12.5 pounds; Model 328 is 10⅜ in. by 9½ in. by 3¾ in., and weighs 16.5 pounds.

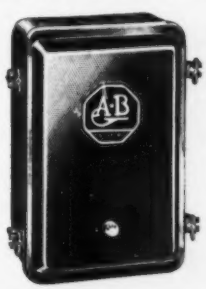
Compact Lamp Base and Cap . .

A base and cap designed for use with Lumiline lamps has been announced by the General Electric Company, Merchandise Department, Bridgeport, Conn., which requires but ½ in. of space for two bases end to end. Applications for this line include the lighting of sidewalk and ceiling fixtures, store counters, window displays. A straight line of light of any length is claimed to be obtainable by placing two or more lamps end to end. The bases are 45/64 in. by 1¼ in. by 13/16 in., overall dimensions, made of black or white Textolite. The caps, also made of this material,

clip over the end of the lamps, while their circular connector snaps securely in to the base. It serves as a rigid holder for the lamp and provides all electrical contacts. With the lamp in place the distance from its centerline to the bottom of the base is 1 3/16 in. The base may be either surface or flush mounted.

Dust-Tight Switch . . . . . .

Type E, sheet-metal, dust-tight enclosures for solenoid-operated switches are announced by Allen-Bradley Co., Milwaukee, Wis. Their Bulletin 709 switches of sizes 2 and 3, to take care of polyphase motors up to 15 hp., 110 volts; 30 hp., 220 volts; and 50 hp., 440 volts, as well as self-starting, single-phase motors, can be accommodated in these enclosures. Dust-tightness is claimed through the use of a thick felt gasket between the cover and base, while the cover is held in place with hinged bolts and wing nuts. Conduit knockouts are provided in all four sides and the back of cabinet. The enclosure is black enameled on the outside with a white enameled interior finish which reflects light

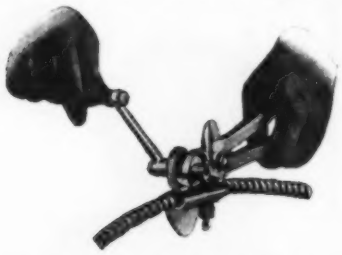


onto terminals, switch parts and overload relays, a feature claimed to add to the ease of installation and inspection. This starter is offered as being suitable wherever dust-laden air is encountered, except for Class 2, Group D hazardous locations.

Armored Cable Cutter

A hand tool for cutting armored cable and flexible steel conduit is announced by Mechanical Products Corp., New York, N. Y. A circular fine-tooth armor cutting saw is employed which is revolved by a handle similar to that of a small hand drill. The cable is held in cutting position in a V-block jaw grip by means of rubber-gripped handles.

Saws are quickly removable by loosening one locknut, while the depth of cut is adjustable by means of two knurled tension check-nuts. The advantages claimed for this tool are: no cut insulation; freedom from shorts; no injury to



hands, knees or clothes of mechanics; and less physical effort required in cutting armored cable.

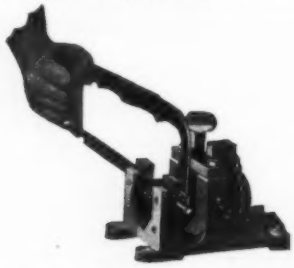
Attic Ventilator . . . . . .

A line of attic ventilation and cooling equipment that is designed especially for domestic use is announced by the Buffalo Forge Co., Buffalo, N. Y. The

Type "HVA" blower is equipped with a multiblade rotor for separate belted motor drive. It is claimed to handle a large volume of air very quietly. This model is made in ten sizes and can be supplied with rotor bearings which are floated on rubber insulators. Canvas blower connections are recommended where duct work is provided in the house. The "Breezo" line of disk fans, ranging from 8-in. to 36-in. sizes is available for attic installations for which no duct work is installed.

Tubing Vise . . . . . .

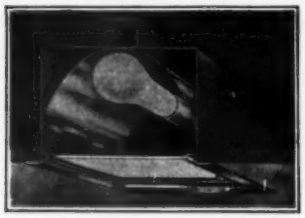
A line of tools for holding thin wall tubing so as to permit a square end to be cut with a hacksaw has been announced by Beaver Pipe Tools, Warren, O. The No.



4 "Square-End Sawing Vise" has a range of 1¼ to 4-in., and is made of malleable iron, while the No. 2 model, for ½ to 2-in. tubing, is made of aluminum. Both tools are self contained and provide renewable steel inserts for the hacksaw blade cutting guides. They are claimed to hold without marring or crushing the tubing. A ¼ to 2-in. No. 100 wheel cutter for tubing is also available.

Flush-Recessed Light Boxes . . .

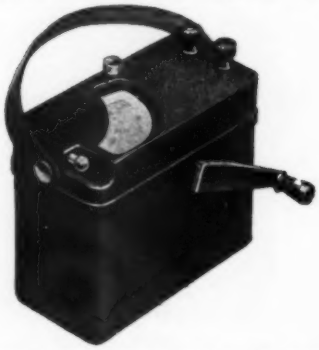
The Garcy line of metal light boxes for providing flush or recessed lighting sources in residential or commercial installations, is announced by the Garden City Plating and



Mfg. Co., Chicago, Ill. These boxes are available in complete assemblies of various shapes and dimensions, including wiring troughs; metal housings; curved sheet aluminum reflectors; angle porcelain sockets; flashed opal glass; and removable, channel type glass frames. Ease of installation, relamping and cleaning is claimed for these units, due to the design of trim, panel hinges and catches. Ventilation has been provided.

Compact Megger . . . . . .

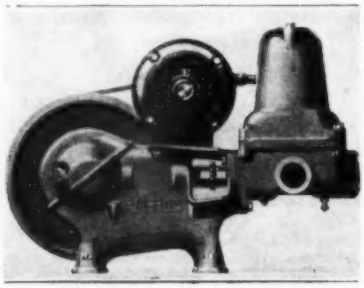
The type OK megohmmeter, weighing only 4½ lbs., is announced by Herman H. Sticht Co., New York, N. Y. This instrument has a range of 20 megohms with a



220-volt d.c. generator, and can be used by electrical contractors for low voltage wiring, motor and apparatus tests. A worm-and-gear crank-operated generator drive is employed which is claimed to turn easier and with minimum noise.

Electric Water System . . . .

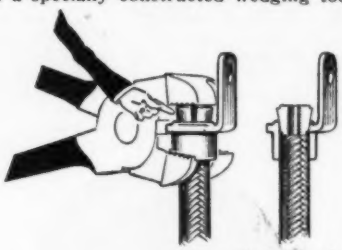
A line of shallow well motor-driven pumps ranging from 250 to 600-gal. capac-



ity is announced by Sta-Rite Products, Inc., Delavan, Wis. The simplicity of their design is claimed to permit greater ease of servicing and dismantling. All models are so standardized that the pump may be converted from one capacity to another after the unit is in service. The valves and strainer are removable without disturbing pipe or wiring connections.

Wedge Connector . . . . . .

A line of "Wedge-on" solderless terminals has been developed by the Thomas & Betts Co., Elizabeth, N. J., which are installed on the wire by means of a specially constructed wedging tool.

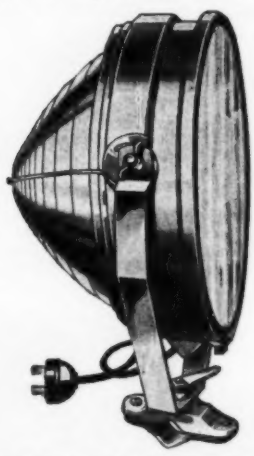


See that plug?

A tapered bronze wedge is forced into the lug barrel, thus engaging the bare wire for the whole length of wedge under a pressure that is claimed to withstand vibration, jolts and temperature changes. It is made for wire sizes from No. 18 up to No. 4. Quick installation and permanent, neat connections are claimed for this device.

Weatherproof Floodlight . . . .

A weather-proof floodlight is announced by Wilson Lighting, Inc., Chicago, Ill., in which a colored glass filter lens is shielded behind a clear glass lense. Other features include an asbestos gasket seal, wrench-type locking clamp, weatherproof soft rubber plug and cord and brass hardware. A non-breakable reflector is used which is arranged for easy removal for relamping



without disturbing the lenses, thus minimizing breakage. Increased efficiency is claimed, since no neck hole is required in the back of reflector. The reflecting surface is continuous around the back of the lamp, thus increasing its reflecting area. This unit accommodates P.S. type or 250-watt G-30 flood lamps, and may be had with concentrating or spread-beam reflectors.

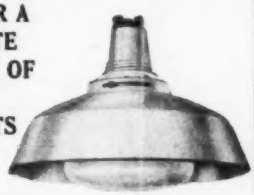
MULTI REFLECTORS

Modernization work in industrials calls for new and efficient lighting. "MULTI" Steel Reflectors—they give lighting efficiency—they do not rust, chip or crack. Porcelain enameled white inside, green outside. Made in all standards types and sizes.

2-Piece Dome Reflectors

The "MULTI" 2-piece dome industrial fixture has a white diffusing glass globe with an all white reflector. The glass globe is held by a "MULTI" "Gripit" holder with internal finger support. No possible breakage from vibration or expansion.

SEND FOR A COMPLETE CATALOG OF MULTI PRODUCTS



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1840 W. 14th St. CHICAGO, ILL.

SHERMAN BRASS FIXTURE CONNECTOR

APPROVED

Corner View
U. S. Pat. No. 1352032

End View

The Sherman brass connector is indeed "The Perfect Solderless Connector." It fits all wires, No. 12 and smaller. Therefore, only one size is needed.

The screws are non-removable. No valuable time is spent in looking for screws that drop out of connectors.

Made of heavy brass, which cannot rust, thus assuring high conductivity.

Tell your customers about these features of the Sherman Brass Fixture connector.

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Steel Reflectors and Accessories—Bulletin No. 6-A, 66 pages. "Multi" porcelain enameled steel reflectors and sockets, dust and vapor-proof designs, floodlights, commercial lighting fixtures, outlet accessories, cutout bases, porcelain bushings, and lugs. Multi Electrical Mfg. Co., Chicago, Ill.

Wires, Cords and Cables: A loose leaf catalog containing illustrations and specifications on all types of wire, cable, flexible cords, compounds and insulations. A section illustrates numerous manufacturing processes and the equipment employed. Crescent Insulated Wire & Cable Co., Trenton, N. J.

Everdur Metal: Anaconda Publication E-12, twelve pages. A digest of Everdur rigid conduit and other important electrical wiring materials and fittings now available through various manufacturers, also interesting illustrations of corrosive conditions, explanations of Everdur alloy and its application, and a table of corrosive and hazardous locations for which this metal is most advantageous. American Brass Co., Waterbury, Conn.

Commercial-Industrial Lighting: Catalog 26, 288 pages of listings, illustrations and engineeering data on reflectors, lighting equipment, floodlights and accessories. Benjamin Electric Mfg. Co., Des Plaines, Ill.

Exhaust and Ventilating Fans: Folder No. 259, "Emerson Exhaust Fans," eight pages includes tables of air changes and performance, and a list of places where exhaust fans should be used. Folder No. 260, "Modern Kitchen Ventilation" illustrates Emerson electrically reversible ventilating fans in three types. The Emerson Electric Mfg. Co., St. Louis, Mo.

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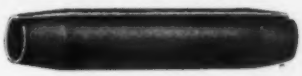

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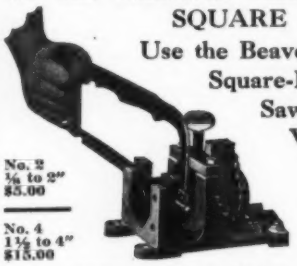

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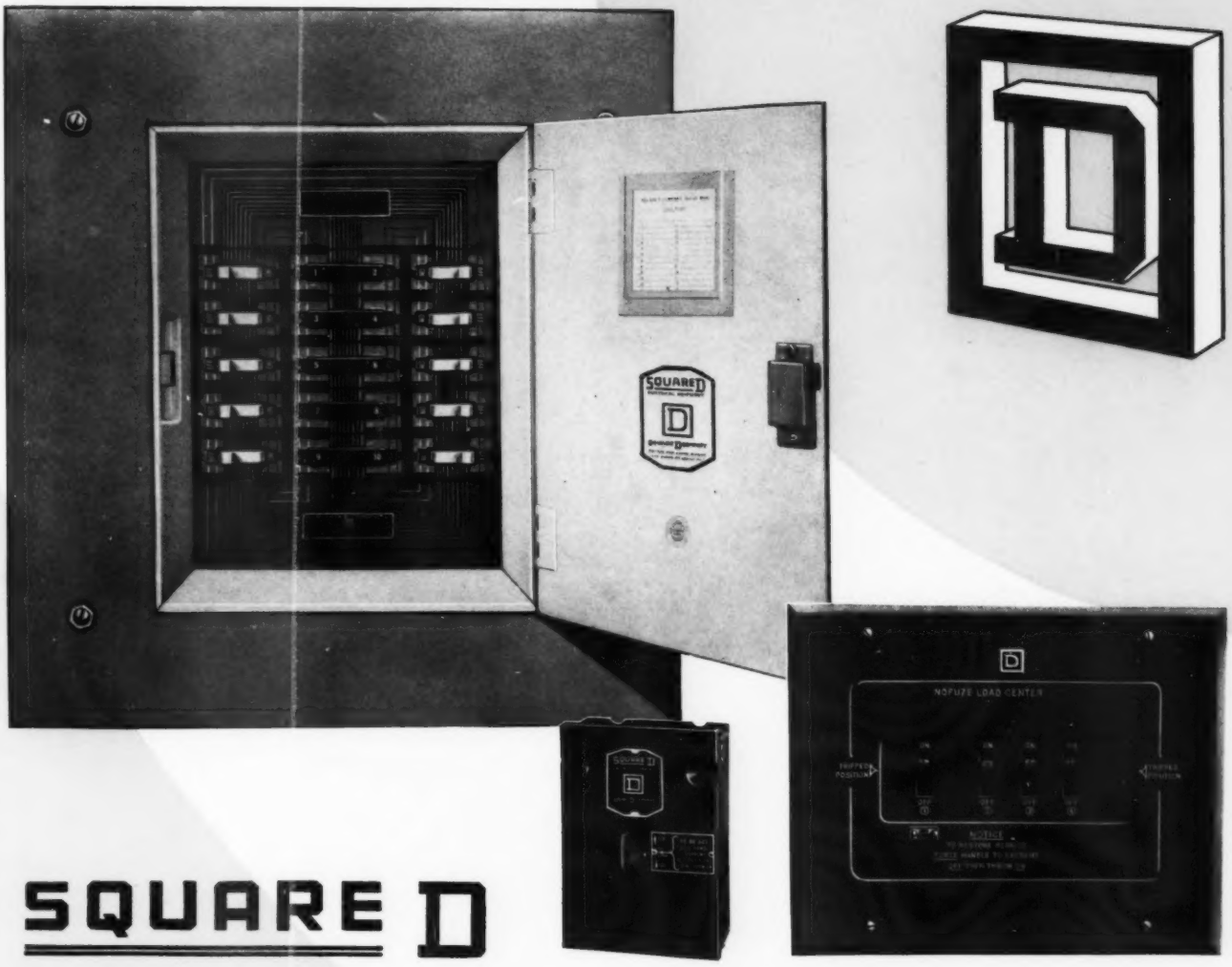

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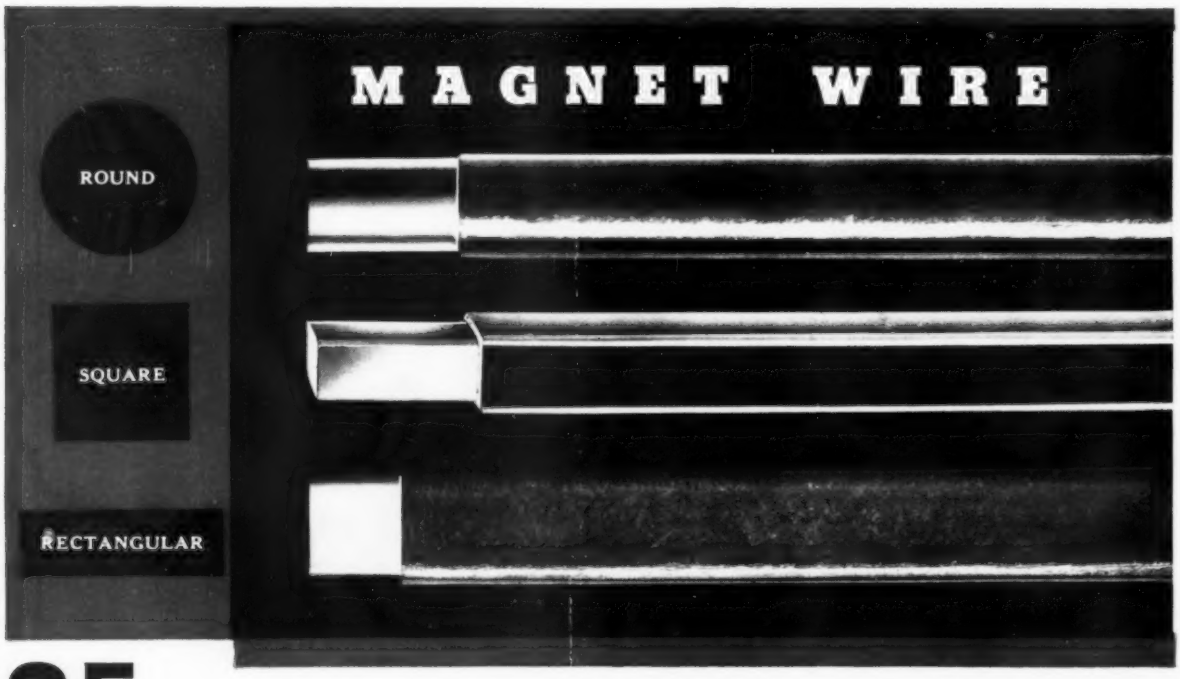

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